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School of Pharmacy 1993-1995 Catalog

Entry-Level
Doctor of Pharmacy
(Pharm.D.)



School of Pharmacy
(Maryland College of Pharmacy, 1841-1904)

Entry-Level Doctor of Pharmacy (Pharm.D.)
1993-95 Catalog and 134th Announcement
for the Professional Degree Program
Volume 57, Number 1, November 1993



UNIVERSITY OF MARYLAND
AT BALTIMORE

School of Pharmacy
University of Maryland at Baltimore
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Baltimore, MD 21201-1180

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Financial Aid (UMAB)	(410) 706-7347
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The University of Maryland is accredited by the Middle States Association of Colleges and Secondary Schools and is a member of the Association of American Universities. The School of Pharmacy's Bachelor of Science in Pharmacy (B.S.P.), Doctor of Pharmacy (Pharm.D.) and continuing education programs are accredited by the American Council on Pharmaceutical Education. The school is a member of the American Association of Colleges of Pharmacy.

The University of Maryland at Baltimore is an equal opportunity institution with respect to both education and employment. The university's policies, programs and activities are in conformance with pertinent federal and state laws and regulations on nondiscrimination regarding race, color, religion, age, national origin, sex and disability.

School of Pharmacy
1993-1995
Catalog

Entry-Level
Doctor of Pharmacy
(Pharm.D.)

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Introduction

This catalog describes the academic policies and curriculum for the four-year entry-level Doctor of Pharmacy (Pharm.D.) program that began in the fall of 1993. This is an entirely new program developed by the faculty after extensive analysis of the current programs, and discussion and input from practitioners regarding the needs of the profession. The new curriculum has inherent flexibility which allows a wide range of choice for students. Most courses do not run an entire semester but are presented in shorter time frames so that the students can focus on three or four subjects rather than six or seven courses. This innovation allows more time for in-depth discussion of content areas. Other innovations include the optional pathways which offer avenues for specialization within an area of interest, such as pharmacotherapy or community practice, and the expanded opportunities to take electives—21% of the curriculum.

The University of Maryland's new four-year entry-level Pharm.D. degree requires the prior completion of at least 60 semester credit hours in pharmacy prerequisites. The prepharmacy courses may be taken at any accredited two or four-year institution. The entry-level Pharm.D. program requires the successful completion of a minimum of 132 semester hours including 100 didactic credits and 32 experiential credits.

The current Bachelor of Science in Pharmacy and the Post B.S. in Pharmacy Doctor of Pharmacy programs are being consolidated into the entry-level Doctor of Pharmacy program. No new students will be admitted to these programs. **All information regarding these programs is listed in the School of Pharmacy 1991-93 catalog (Vol. 56, No.1) and will remain in force for students while those programs are being offered.**

ACADEMIC GOALS

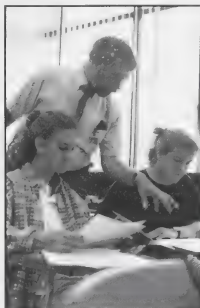
The broad goals and objectives of the entry-level Pharm.D. program are encompassed within the strategic plan adopted by the school's faculty in August 1989:

The School of Pharmacy seeks to provide individuals with the knowledge and skills necessary to begin pharmacy practice, and in so doing accept and perform professional responsibilities with competence. Graduates should have the ability to adapt their practice to the changing health care system, and should be prepared to engage in a continuing program of professional development.

The professional curricula will be innovative and flexible, based on strong basic sciences, have extensive clinical content taught by practice-based faculty, and emphasize the development of problem-solving

and collaborative skills. The opportunity for advanced professional and clinical education will be made available.

The school seeks to create an educational community that extends beyond traditional classroom sites and offers students and faculty a variety of learning environments. These will include cultural and interprofessional programs which broaden the experiences of our graduates.



In the past, the school has been very successful in meeting these goals, as noted by the American Council on Pharmaceutical Education during its recent accreditation visit in February 1992.

Curricular change within the school has been prompted, in part, by the adoption of the concept of **pharmaceutical care** by the practice of pharmacy. In the words of the AACP Commission to Implement Change in Pharmaceutical Education:

Pharmaceutical care focuses pharmacists' attitude, behaviors, commitments, concerns, ethics, functions, knowledge, responsibilities and skills on the provision of drug therapy with the goal of achieving definite outcomes toward the improvement of a patient's quality of life. These outcomes of drug use are: 1) cure of a disease; 2) elimination or reduction of symptoms; 3) arresting or slowing a disease process; 4) prevention of disease; 5) diagnosis of disease; and 6) desired alterations in physiological processes, all with minimum risk to patients.

Historically the major patient-oriented, professional functions of pharmacy have involved preparing the drug product and providing it to the patient. These continue to be vital components. But, in response to the increasing effectiveness, potency, preciseness, risk and cost of drug

therapy and the increasing use of drugs in diagnosis, pharmacy has gone beyond those functions.

Thus the scope of contemporary pharmacy activities includes:

- selecting the drug product dosage form and source of supply;
- determining the dose and dosage schedule;
- preparing the drug product for patient use and providing it to the patient;
- providing drug information to patients and others;
- participating in the process of drug use decisions;
- monitoring patients to maximize compliance and to detect adverse events; and
- monitoring patients to enhance therapeutic outcomes.



The central goal of the entry-level Doctor of Pharmacy curriculum is to provide our graduates competency in the knowledge, attitudes, values and skills necessary to provide, coordinate and manage primary pharmaceutical care in collaboration with patients and their families, prescribers, and other health care providers or care givers, in a variety of practice settings.

The School and Its Environment

THE SCHOOL OF PHARMACY

Historical Background

The University of Maryland, School of Pharmacy, which celebrated its 150th anniversary in 1991, has a rich and distinguished heritage. Incorporated as the Maryland College of Pharmacy on January 27, 1841, it gave its first lectures in November of that year. It is the oldest pharmacy school in the South and the fourth oldest in the country. Primarily an independent institution until 1904, the Maryland College of Pharmacy then became the department of pharmacy of the University of Maryland. In 1920, the University of Maryland in Baltimore merged with the Maryland State College at College Park to form the state university. Today, it is one of seven professional schools which form the University of Maryland at Baltimore (UMAB).

Throughout its history, the School of Pharmacy has been a local and national leader for the profession of pharmacy. It was a founding member of the American Association of Colleges of Pharmacy, which was established to formulate uniform standards for the graduation of pharmacy students. The school was instrumental in the development of the American Council for Pharmaceutical Education, the national accreditation organization for schools of pharmacy.

In 1970, through the efforts of the school and the Maryland Board of Pharmacy, Maryland became the first state to replace the unstructured internship program with a professional experience program incorporated in the school's curriculum. This set the national standard for professional pharmacy education. Likewise in 1980, Maryland became the first School of Pharmacy to establish a Center for the Study of Pharmacy and Therapeutics for the Elderly, now the national model for pharmacy geriatric education.

The school moved to Pharmacy Hall, a seven-story facility on Pine Street, in 1982. Situated at the west entrance to the UMAB campus, Pharmacy Hall houses most of the classroom and lecture facilities, research laboratories, conference rooms and administrative offices for the School of Pharmacy. Pharmacy Hall also houses Food and Drug Administration personnel working in conjunction with the Pharmaceutical Sciences/Pharmaceutics Program. The Pharmacy Practice and Science Department and the Pharmaceutical Sciences Department's Pharmacokinetics-Biopharmaceutics Laboratory are located about two blocks away in the five-story Allied Health Building which opened in 1992. Located at 100 Penn Street, it is diagonally across from the Maryland Pharmacists Association, which is housed in the Kelly Building at 650 W. Lombard Street.

Commitment to Diversity

The school strives to achieve a broad racial, sexual and ethnic balance in its enrollment. To achieve this objective it gives every consideration to minority student applications. The current diversity of student population is reflected in 1993 enrollment statistics: 13% African American, 27% Asian, 55% Caucasian, 2% Hispanic, and 3% International (foreign) students.

Community and Professional Service and Research Support Programs

In addition to its degree programs, the University of Maryland School of Pharmacy offers several community service and research support programs.

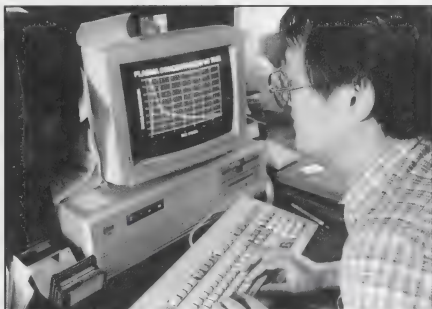
The **School of Pharmacy Academic Computing Laboratory** is located on the third floor of Pharmacy Hall. It has sixteen 486 computers with VGA monitors for professional student and general use. There are two laser printers in the lab. The school has 303 computers—271 IBM PC-type and 32 Apple type—and 215 printers including 60 laser printers and one color laser. Most of these computers are hooked up to a Novell Local Area Network (LAN) to share files, software and to use electronic mail. The Swain Pharmacy Practice Laboratory is equipped with state of the art computers and pharmacy software for educational use.

The **Biomedical Chemistry NMR Center** houses a G.E. 300 MHz nuclear magnetic resonance spectrometer. The superconducting magnet, the heart of the instrument, is permanently immersed in a vacuum-jacket reservoir of liquid helium (-260°C) and allows the detection and accurate determination of protons, ^{13}C , ^{31}P and other nuclei of biological importance. The first instrument of its kind on the UMAB campus, the NMR has opened up many new areas of research within the school, and greatly increasing the number of inter-school collaborative ventures.

The **Center on Drugs and Public Policy** is a cooperative program of the School of Pharmacy and the Policy Sciences Graduate Program, under the auspices of the University of Maryland Graduate School, Baltimore. The goal of the center is to contribute to informed debate of policy issues related to drug use and abuse in our society. In addition to conducting research on major drug policy issues, the center organizes conferences and workshops and serves as a consultant on drug issues to organizations in the private and public sectors. Fellowships or externships are available to those from industry, state and local agencies, foreign governments or universities who want a campus-based experience in drug-related policy research as well as an orientation to relevant agencies and organizations based in the Washington, D.C. and Baltimore areas.

The **Center for the Study of Pharmacy and Therapeutics for the Elderly** serves as the focal point of all geriatric education, service and research activities within the school. It provides continuing education programs both on the state and national levels. Funding from federal and private sources allows the center to encourage and support relevant research by faculty and graduate students from all school departments. The Center is administratively responsible for the Elder-Health Program and the Parke-Davis Center for the

Education of Elderly. The Parke-Davis Center for the Education of Elderly develops educational materials for use by the Elder-Health and Elder-Ed programs. The Elder-Health Program trains pharmacy students and retired pharmacists about the social and psychological aspects of drug use among the elderly as well as the therapeutic goals of treatment for prescribed and over-the-counter medications. They then give presentations for community groups of elderly.



The **Computational Chemistry Laboratory** is used for the study of biochemical systems via mathematical models. The goal of such studies is to allow for an understanding of the relationship of the 3-dimensional structure and dynamics of biological molecules to their physiological function. Such knowledge allows for a detailed understanding of the molecular basis of disease which may be used for the rational design of therapeutic agents. These approaches greatly increase the efficiency of the drug discovery process leading to significant savings of both time and money, which may ultimately be passed on to the consumer.

The **Drug Development Facility**, established as part of a three year \$7.1 million collaborative agreement with the Food and Drug Administration, is one of the most modern industrial and pharmaceutical technology research and manufacturing facilities in the country encompassing both state-of-the-art research facilities and a GMP (Good Manufacturing Practices) laboratory. Under the FDA contract, experimental clinical products are manufactured and tested for bioequivalence. In addition to FDA research, the Drug Development Facility can accept contracts from outside to develop and manufacture products for clinical studies. This Facility serves as an important resource for research as well as a teaching tool for advanced students.

The **Maryland Poison Center** serves as the regional poison center for the state of Maryland. As an emergency telephone service, it provides toxicity and treatment information on a 24-hour basis to the general public and to health professionals. Staffed by pharmacists and registered nurses, the center

handles over 54,000 poison-related calls each year. It is an American Association of Poison Control Center's certified regional poison center. University of Maryland at Baltimore health professional students can apply for part-time paid positions with the center.

The **Mass Spectrometry Laboratory** determines the structure of unknown chemicals and provides quantitative measurements of drugs and chemicals from a variety of sample sources. The laboratory's focus is on conducting both basic and applied research, increasing analytical services on the University of Maryland at Baltimore campus and supporting expanded mass spectrometry-related research activities in the larger scientific community.

The **Mental Health Program** of the School of Pharmacy is a joint venture with the Developmental Disabilities Administration and Mental Hygiene Administration of the state of Maryland. Its primary goal is to upgrade all aspects of pharmacy practice within the state's mental health facilities. The program also serves as a site for pharmacologic and administrative research in mental health, a testing ground for the development of innovative strategies in mental health pharmacy practice and a training resource for mental health-related issues. Members of the program's faculty serve at nine mental health sites around the state.

The **Office of Substance Abuse Studies** is responsible for the school's drug and alcohol abuse programs, including administration of the Student Committee on Drug Abuse Education (SCODAE), the operation of the drug abuse information telephone service and the publication of a quarterly newsletter, **PharmAlert**. SCODAE is a volunteer organization of pharmacy students who, with faculty support and guidance, are committed to the development of rational attitudes about drugs by serving as a source of accurate, unbiased drug information. Pharmacy students present drug education lectures to a variety of groups, from elementary school children to health and education professionals. The office administers UMAB's interprofessional Drug and Alcohol Abuse Prevention Program and is instrumental in the operation of the Pharmacists Rehabilitation, which is jointly sponsored by the Maryland Pharmacists Association, the Maryland Society of Hospital Pharmacists and the University of Maryland School of Pharmacy.

Student Government

Student government activities are coordinated by the school's Student Government Alliance (SGA). All professional students belong to the SGA. Through its officers and committees, the SGA sponsors numerous social, service and educational events. The executive committee of SGA includes the presidents of all school organizations. This committee meets periodically with school administrators to discuss important issues. At the campus level, the University Student Government Association (USGA) coordinates student government activities. Students are represented by senators and officers elected by the UMAB schools.



Lecture Series

The School of Pharmacy currently has three endowed lectureships and a special symposium:

Francis S. Balassone Memorial Lecture. The Maryland Pharmacists Association, the School of Pharmacy Alumni Association and the school sponsor this lectureship as a memorial to Francis S. Balassone, a 1940 graduate of the school, a past president of the Alumni Association, a distinguished former faculty member, and a past president of the National Association of Boards of Pharmacy.

Andrew G. DuMez Memorial Lecture. This lectureship was established in 1969 by Mrs. Andrew G. DuMez as a memorial to her late husband, Dr. Andrew G. DuMez, dean of the University of Maryland School of Pharmacy from 1926 to 1948, and a distinguished educator and leader in pharmacy in Maryland, the United States and internationally.

Ellis Grollman Lecture in Pharmaceutical Sciences. In 1983, Mrs. Evelyn Grollman Glick funded a lecture program as a memorial to her brother, Ellis Grollman, a pharmacy school graduate in the class of 1926. Each year nationally recognized researchers in the pharmaceutical or related basic sciences are selected to present this lecture.

The **Peter P. Lamy Symposium** was inaugurated in 1992 in recognition of Dr. Lamy's work as the Parke-Davis Professor and Chair in Geriatric Pharmacotherapy. Dr. Lamy was responsible for obtaining the first endowed chair in the School of Pharmacy in 1990 underwritten by a gift from the Warner-Lambert Company to create the Parke-Davis Chair in Geriatric Pharmacotherapy. Dr. Lamy is an internationally-recognized authority on geriatrics and gerontology.

Endowed Chairs

The **Emerson Professorship in Pharmacology** was endowed in 1927 as a Chair in Biological Testing and Assay by Captain Isaac Emerson, President of the Emerson Drug Company. The first chair was filled by Dr. Marvin Thomp-

son who was a pharmacologist at the Food and Drug Administration at the time. Dr. Clifford W. Chapman, a pharmacologist from the Canadian National Laboratories was appointed to the Chair in 1938. Dr. Casimer Ichniowski and Dr. Naim Khazan were the third and fourth appointees to the Chair. In 1988, Dr. Gerald M. Rosen, professor and chairman, pharmacology and toxicology, was appointed Emerson Professor. In 1992, Dr. Rosen was named an Eminent Scholar by the Maryland Higher Education Commission.

The **Parke-Davis Chair in Geriatric Pharmacotherapy** was established in 1990 by a \$1 million gift from Warner-Lambert Company on the eve of the 125th Anniversary of Parke-Davis and the School of Pharmacy's 150th Anniversary. The chair recognizes the scientific contributions in the area of geriatrics and gerontology of Peter P. Lamy, Ph.D., Sc.D. (Hon.), appointed Parke-Davis professor in 1991. As the Parke-Davis Professor, Dr. Lamy was named an Eminent Scholar by the Maryland Higher Education Commission.



Alumni Association

The Alumni Association of the University of Maryland School of Pharmacy, established in 1926 to foster an interest in the school, encourages fellowship among its members, and promotes superior scholarship in its students and graduates. Each year the association sponsors various activities including the fall meeting, and the spring banquet honoring the graduating seniors and the 50-year class. The Alumni Association awards eight scholarships based on need to deserving students. Three of these scholarships are named in memory of William J. Lowry, Henry G. Seidman and Alex Weiner. The Alumni Association contributes to production and distribution of the quarterly **Rx Newsletter**. The Alumni Association plays a leadership role in the fund raising activities of the school by serving as callers in the Alumni Volunteer Phonathon and as members of the David Stewart Associates and the University's Presidents Club.

The David Stewart Associates

The school traces its beginnings to a man with a vision—David Stewart. Civic leader, chemist and pharmacist, Stewart was instrumental in founding the Maryland College of Pharmacy in 1841 and, in 1884, the college elected him to the first chair in pharmacy in the United States. In his honor the school has named its major annual giving club—The David Stewart Associates. Alumni, friends and faculty who contribute \$1,000 to the school annually are automatically enrolled. During FY'93, the prestigious David Stewart Associates had 76 members.

Members who pledge to give \$10,000 over a five-year period are eligible for membership in the University of Maryland System Presidents Club. Many of our members are in both giving clubs.

THE UNIVERSITY OF MARYLAND AT BALTIMORE

The University of Maryland at Baltimore is the founding campus of Maryland's public university system and a thriving center for life sciences research and community service. Seven graduate and professional schools educate research scientists and many of the region's health care, law and social work practitioners.

With \$110 million in sponsored program support, UMAB is one of the fastest growing biomedical research centers in the country. The university is ideally configured to tackle complex health care, public policy and societal issues. Our urban location and unique combination of strengths create opportunities to address regional problems in a comprehensive way. The solutions can have global implications. AIDS, aging, schizophrenia, hypertension, lead poisoning, cancer, child abuse and homelessness all are subjects of multidisciplinary research, scholarship and community action.

New partnerships among university components and with the University of Maryland Medical Center and new Veterans Affairs Medical Center are strengthening interdisciplinary endeavors in both research and teaching. Our location, within the Baltimore-Washington-Annapolis triangle, maximizes opportunities for collaboration with government agencies, health care institutions and life sciences industries.

Health Sciences Library

The Health Sciences Library is distinguished as the first library established by a medical school in the United States, and is a recognized leader in state-of-the-art information technology. The Health Sciences Library is the regional medical library for 10 southeastern states, the District of Columbia, Puerto Rico and the Virgin Islands, as part of the biomedical information network of the National Library of Medicine.

Serving all schools on campus and UMMS, the library contains more than 300,000 volumes, including 2,900 current journal titles, and is ranked in size among the top 25 health sciences libraries in the country.

The library's online catalog allows you to look for materials by title, author, subject, keyword, call number, series, meeting and organization name. In addition to giving information on library holdings, the system can determine whether the material has been checked out of the library. The online catalog can be accessed from any computer terminal on the UMAB campus that is linked to the campus network, or from any dial access terminal.

The library supports several computerized search services: MaryMed Plus, HSL Current Contents[®], CD-ROM LAN, Micromedex CCIS, and a Mediated Searching Service. Information specialists provide assistance in using library services. Training seminars are held throughout the year.

Computer Resources

Microcomputer support for faculty, staff and students, as well as mainframe research and instructional computing on the IBM 4381, are provided by Health Informatics and Computer User Services, both units of Information Services at UMAB. Computers in Technology Assisted Learning (TAL) Centers in the Information Services Building, the Health Sciences Library and elsewhere across campus are available for use by the campus community and for training in applications packages.

Programming languages such as FORTRAN and C, as well as statistical analysis packages like SAS, SPSS-X and BMDP are available for the mainframe computer. Free worldwide electronic mail accounts, via the Professional Office System (PROFS), enable faculty, staff and students to exchange notes, files and documents with others both at UMAB and internationally via Bitnet.

Instructional courses and training classes are available in WordPerfect, Lotus, dBase and graphics, among others. Students, faculty and researchers are able to use Information Services' resources at every step of their work, from collection of information through preparation for final presentation, including desktop publishing, color printing and plotting, overheads and color slides.

The IBM 4381 system is accessible from the User Area, computers attached to the campus network and by dial-up modem from either office or home. Staff consultants can help with first aid, program debugging and applications support.

Student Health Services

Student and Employee Health provides comprehensive care to University of Maryland at Baltimore students. The office, staffed by family physicians and nurse practitioners, is open from 8 a.m. until 4:30 p.m., Monday through Friday, and until 7 p.m., Monday through Thursday, for emergencies. Patients are seen by appointment only.

Gynecological services, including health maintenance (PAP smears, etc.), family planning and routine problems, are provided by the family physicians or nurse practitioners.

All full-time students are required to have health insurance. An excellent insurance policy is available through the campus. The cost of most care provided at Student and Employee Health is paid for through the student health fee.

Hepatitis B is an occupational illness for health care providers. Immunization against Hepatitis B is required for medical, dental, dental hygiene, nursing, medical technology and Pharm.D. students. The series of three immunizations is given through Student and Employee Health.



Counseling Center

The Counseling Center provides professional individual and group counseling to UMAB students. Some of the problems that students seek help with include: stress, relationships, drugs or alcohol, eating disorders, loss of a loved one and stressful changes in school or home life.

Students are always seen by a professional—social worker, psychologist, psychiatrist or addictions counselor. Costs associated with seeing a therapist usually are covered by health insurance; however, no one is ever denied services based on ability to pay. Students are seen by appointment and students' class schedules can be accommodated in scheduling appointments. All Counseling Center services are completely confidential.

Parking and Transportation

On campus parking is available to students. Commuters may park in the Lexington Garage (Lexington and Pine Streets) between 6 a.m. and 11 p.m. The garage operates on a first-come, first-served basis. Commuting students must obtain a parking permit from the Parking and Commuter Services Office, then pay the established daily rate when parking in the garage.

Students who live in on-campus housing pay for parking by the semester or year and are guaranteed 24-hour parking in a garage adjacent to their residence facility. For more information about parking on campus, write

Parking and Commuter Services, University of Maryland at Baltimore, Baltimore, Maryland 21201 or call 410 706-6603.

Public transportation makes the campus accessible by bus, subway and light rail. More than a dozen MTA bus routes stop in the campus area. The Baltimore Metro runs from Charles Center to Owings Mills. Stops closest to campus are at Lexington Market and Charles Center. A new Light Rail line connects northern Baltimore County with Oriole Park at Camden Yards. The UniversityCenter stop is at Baltimore and Howard Streets.



Living in Baltimore

Baltimore's a fun, friendly city with many affordable and convenient housing options. The brochure *Living In Baltimore* describes on- and off-campus options for UMAB students; it is available through most UMAB admissions offices or by calling the Residence Life Office at 410 706-7766.

On-campus living options include furnished university-owned apartments and dormitory style accommodations plus unfurnished apartments in a half-dozen privately owned loft district buildings on campus. The Baltimore Student Union and Pascault Row Apartments are the two university owned on-campus housing complexes.

Many students choose to live in neighborhoods surrounding the UMAB campus. A wide range of rooms, apartments and home rentals are available throughout the metropolitan area. The Student Life Office, located in the Baltimore Student Union, keeps a listing of available rooms and apartments.

Athletic Center

The campus Athletic Center, on the tenth floor of the Pratt Street Garage, is equipped with a squash court; two handball/racquetball courts; two basketball courts which are also used for volleyball; and a weight room with two 15-station universal gyms, stationary bikes and rowing machines. Men's and women's locker rooms each have a sauna and showers.

Men's basketball, co-ed intramural basketball and volleyball teams compete throughout the fall and spring semesters. Squash and racquetball tournaments also are held in the facility.

BALTIMORE

In addition to professional opportunities, the city of Baltimore offers a stimulating environment in which to live and study. Several blocks from the campus is the nationally acclaimed Inner Harbor area, where Harborplace, the National Aquarium, the Maryland Science Center and other facilities share an attractive waterfront with sailboats, hotels, restaurants and renovated townhouses. The new Baltimore Metro and Light Rail system connect the downtown area to the outskirts of the city.

Baltimore boasts lively entertainment, world class museums, fine music and professional theater. For sports fans, Baltimore features Orioles baseball (the new stadium is two blocks from campus) and league-winning lacrosse. The nearby Chesapeake Bay offers unparalleled water sports and the seafood for which the region is famous.

Admissions Information

The University of Maryland actively seeks to enroll students with diverse backgrounds in order to make the educational experience more meaningful for each student.

APPLICATION PROCEDURES

To obtain Pharm.D. program applications and other information write:

School of Pharmacy
University of Maryland at Baltimore
20 North Pine Street
Baltimore, MD 21201-1180
ATTN: Admissions Information

Pharm.D. applicants may call the School of Pharmacy's Office of Student Affairs at (410) 706-7653 or 1-800-852-2988 (toll free) with specific questions regarding the school or the application process. Application forms are typically available in September for the next academic year, which begins each fall. Applicants should submit: (1) a completed application, (2) supporting documents and (3) a \$40 application fee directly to:

Office of Records and Registration
University of Maryland at Baltimore
621 West Lombard Street
Baltimore, MD 21201-1575

Those seeking advanced degrees (M.S. and Ph.D.) through the school must apply to: University of Maryland Graduate School, 5401 Wilkens Ave., Baltimore, MD 21228. For information on specific graduate programs within the school, write:

Graduate Programs - * specify discipline *
University of Maryland
School of Pharmacy
20 North Pine Street
Baltimore, MD 21201-1180

*Please specify the pharmacy graduate program to which you wish to apply: biomedical chemistry, pharmacology and toxicology, pharmaceuticals, pharmacy administration or institutional pharmacy.



Application deadlines

February 1	Application
April 1	All supporting documents (official transcripts and PCAT scores)

Admissions Process

To be considered for admission, applicants must take the Pharmacy College Admission Test (PCAT) and forward their scores to the school. Applications for the PCAT exam are available from the school's Student Affairs Office. Although the PCAT is given in October, February and April, serious applicants should complete the October and/or February exams. An admissions committee of faculty and students reviews PCAT results and official transcripts. Applicants with strong PCAT and/or academic credentials are invited to interview with faculty and students. During the interview, influential factors, such as the applicant's professional and social awareness, verbal and written communication skills, integrity, maturity and motivation, are assessed. Following the interview, the committee makes admission decisions based on the applicant's academic achievement, scores on the PCAT and qualities evaluated during the interview. Academic achievement and/or high scores on the PCAT do not, in themselves, ensure acceptance. While a minimum grade point average (GPA) of 2.5 (A=4.0) is required for application consideration, the average GPA of Fall 1993 entering students was approximately 3.4. Average PCAT scores of admitted students ranged in the 75th to 85th percentile in each of the five areas of the exam. Because of multiple applications for each available position in the entering class, applicants with GPAs below 2.8 have an extremely low probability of admission.

Applicants must present evidence (via official transcripts) of having successfully completed the required prepharmacy program, or being able to complete the prepharmacy course work before the start of classes in the fall.

Prerequisites

A minimum of 60 semester hours of pharmacy prerequisites is required for admission into the entry-level Pharm.D. program. At least one semester of this course work must be taken at an accredited institution in the United States. To enroll in prepharmacy course work, students must apply directly to an accredited college or university, not to the School of Pharmacy. Most institutions have designated prepharmacy programs and advisors. *The School of Pharmacy does not provide any specific information regarding course content and/or requirements for admission into these prepharmacy programs.*

Prerequisites for admission into the entry-level Pharm.D. program are:

Course	Minimum Number of Semesters Required
English	2
Math (Precalculus/Calculus I)	Up to Calculus I
Zoology or Biology	1
General Chemistry	2
Organic Chemistry	2
Physics	2
Humanities and Social Sciences	About 18 hours to a minimum total of 60 hours

INTERNATIONAL STUDENTS

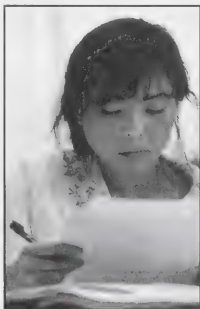
Students who are not citizens or permanent residents of the United States must submit the results of the TOEFL (Test of English as a Foreign Language), certified official copies of transcripts, a statement of financial support, a supplementary information sheet and a summary of educational experiences. These must be submitted with the application and the \$40 application fee to the Office of Records and Registration. International students are also required to take the Pharmacy College Admissions Test (PCAT). Therefore it is essential that international students start the admissions process early.

The school does not accept applicants who have attended **only** a foreign educational institution. The school, due to its small size, cannot adequately certify international credentials and relies on the evaluation performed by other institutions. In addition, experience shows that international students benefit from taking courses at other U.S. institutions before entering our program. International students should be familiar with the rules and regulations of the Immigration and Naturalization Service, which grants admission to the United States.

INTERNATIONAL PHARMACISTS

Individuals who have received their pharmacy degrees from non-U.S. institutions have two options to become licensed pharmacists in the U.S. They can complete the Foreign Pharmacists Equivalency Examination which is given once a year by the National Association of Boards of Pharmacy. Passage of this exam and completion of other requirements allows the international pharmacists to complete state licensure exams. For further information about this process, contact NABP at (708) 698-6227.

International pharmacists are also eligible to apply to the school's entry-level Pharm.D. program and then upon graduation from that program become eligible to complete state licensure exams. Credit may be given for equivalent course work previously completed with a grade of "C" or better. Credit may be awarded after an evaluation of the course and an assessment of student knowledge by the coursemaster. Based on the structure of the curriculum, international pharmacists would enter the first professional year of the four-year Pharm.D program. Admission is based on the evaluation of applicants credentials by the admissions committee.



LICENSURE REQUIREMENTS

Completion of the entry-level Pharm.D. degree satisfies the educational requirement for all state boards of pharmacy in the U.S. Graduates are eligible to take state licensing exams in all states. Information for licensure as a pharmacist in Maryland is available from the Maryland Board of Pharmacy, 4201 Patterson Avenue, Baltimore, MD 21215-2299.

Financial Information

FEES AND EXPENSES 1993-94

Tuition and Fees		Per Year
Entry Level Pharm.D.		
	In State	\$4,500
	Out-of-State	9,500
Per Credit Hour		135
Instructional Resources Fee		96
Clinical Clerkship (3rd & 4th years)		300
Liability Insurance		19
Supporting Facilities Fee		194
Student Activities Fee		50
Student Health Fee		75
Academic Service Fee		10
Other Expenses		
Application Fee (nonrefundable)		40
Nonrefundable Deposit (upon Acceptance for Admission)		200
Late Registration Fee		35
Diploma Fee		35
Books and Supplies, approximately		600
Housing	Approximately	\$3,500-5,000

The university reserves the right to make such changes in fees and other changes although every effort is made to keep the cost to the student as low as possible.

Health Insurance

The university believes that it is important for all students to have health insurance. Thus, health insurance coverage is required of all full-time (nine or more semester hours) professional school students. Students will be billed for health insurance unless they provide proof of similar coverage to Family Medicine Specialists (Student and Employee Health). If documentation is provided, the cost of the premium is waived. The cost of health insurance varies depending on the type of coverage. In 1993, "student only" coverage costs \$741; "student and dependent," \$1,549 and "student and family," \$1,928 per year.

DETERMINATION OF IN-STATE RESIDENCY

The University of Maryland at Baltimore *Policy for Student Residency Classification for Admission, Tuition and Charge-Differential Purposes* changed effective with the fall 1991 semester. There are several significant changes in the criteria for determining eligibility for in-state status. Students currently classified as nonresidents are encouraged to review the new policy. Copies of the policy are available at the Registrar's Office, room 326, Baltimore Student Union, 410 706-7480.

FINANCIAL AID

Student financial aid programs are centrally administered by the University of Maryland at Baltimore, Student Financial Aid. These programs are designed to help students who otherwise would be unable to attend the university. To qualify for aid, students must apply annually and meet certain eligibility requirements. **Students are encouraged to complete their financial aid application by February 15.** Aid packages often include a combination of loans, grants, scholarships and work-study designed to meet the student's need. Students must complete the required Financial Aid application forms, which are available from:

Student Financial Aid
Baltimore Student Union
Room 334
621 W. Lombard Street
Baltimore, MD 21201



SCHOLARSHIPS AND LOANS

School of Pharmacy Scholarships

Through the generous gifts of alumni, friends and professional associations, the school provides additional financial aid to its students. Students do not apply for these awards. Most awards are given to those students who can document unmet financial need through UMAB's Student Financial Aid; others are given to students from a certain geographical area.

The following scholarships have been established:

Alumni Association Scholarships. The Alumni Association awards eight scholarships based on need to deserving students. Three of these scholarships are named in memory of William J. Lowry, Henry G. Seidman and Alex Weiner.

Marilyn I. Arkin Scholarship Fund. The family and friends of Marilyn I. Arkin, pharmacist, the daughter of Ann and Morris Arkin and a member of the class of 1975, established this scholarship as a memorial in 1988. It provides support for professional students in the School of Pharmacy.



H. J. (Jack) Custis, Jr., Memorial Scholarship Fund. In memory of H. J. (Jack) Custis, Jr., class of 1951, a fund has been established for the purpose of awarding scholarships on the basis of reasonable need and academic ability to students in the professional program on the Baltimore campus of the School of Pharmacy. Students eligible for the Custis Memorial Scholarship shall be residents of one of the nine Eastern Shore, Maryland Counties.

Isadore M. and Irene R. Fischer Memorial Scholarship Fund. The families of Isadore M. and Irene R. Fischer have provided a scholarship fund to support a professional or graduate student demonstrating academic excellence in the educational programs of the University of Maryland School of Pharmacy. While financial need can be a consideration, the scholarship award may be made solely on academic performance.

Charles L. Henry Memorial Scholarship. The Charles L. Henry Memorial Scholarship Fund has been provided for Pharm.D. students in the School of Pharmacy requiring financial assistance.

J. Gilbert Joseph Scholarship. In memory of her brother, J. Gilbert Joseph, a former student of the School of Pharmacy, the late Miss Jeanette Joseph provided a generous bequest to endow scholarships to be awarded to qualified students who have maintained a superior scholastic average and who are in need of financial assistance.

Frederick William Koenig Memorial Scholarship. In memory of her husband, Frederick William Koenig, a practicing pharmacist for 50 years, the late Mrs. Valeria R. Koenig has bequeathed a sum of money to endow a scholarship to be awarded annually. The recipient of the award will be selected on the basis of financial need, character and scholarship.

Dr. Dean E. Leavitt Memorial Scholarship Fund. In honor of Dr. Dean E. Leavitt, associate dean for administration and professional services, 1976-1989, the family and the faculty established a fund to support a scholarship covering the final year of pharmacy school for students who have attained at least a cumulative average of 3.0, who have shown superior aptitude and enthusiasm in the course sequence in management, and who have demonstrated, as Dean Leavitt did, a commitment to the qualities of health and humanitarianism, both personally and professionally.

A. M. Lichtenstein Scholarship. In memory of her husband, A. M. Lichtenstein, distinguished alumnus of the School of Pharmacy class of 1889, the late Mrs. Francina Freese Lichtenstein bequeathed a sum of money to endow a scholarship to be awarded annually to a resident of Allegheny County, Maryland. The recipient of the award is to be selected on the basis of financial need, character and scholarship.

Aaron and Rosalie Paulson Scholarship Fund. Mr. Aaron A. Paulson, class of 1924, and his late wife, Rosalie, provide the school with an annual gift to support a first professional year student with demonstrated financial need.

Plough Pharmacy Student Scholarships. The Plough Foundation, created by Abe Plough, founder of Plough, Inc., and the School of Pharmacy have provided funds, the income from which will provide support for pharmacy students. The funds are awarded on the basis of financial need, academic achievement, leadership and citizenship.

Arthur Schwartz Memorial Scholarship Fund. The family and friends of Arthur Schwartz, B.S. Pharm. 1979, Ph.D. in Pharmacy Administration 1987, have established an endowed scholarship fund to honor his memory.

Loan Funds

Rose Hendler Memorial Fund. L. Manuel Hendler and family have established a loan fund in memory of Mrs. Rose Hendler for needy students. Loans from this fund are available to qualified students of the second and third years and are made upon the recommendation of the dean.

Louis T. Sabatino Memorial Student Loan Fund. In honor and memory of her late brother, Louis T. Sabatino, class of 1939, Mrs. Marie Sabatino DeOms has established this fund to provide loans to deserving students.

Benjamin Schoenfeld Memorial Pharmacy Loan Fund. The family of Mr. Benjamin Schoenfeld has established a loan fund as a memorial to him. This fund is available to qualified needy students. Loans are made upon the recommendation of the dean.

STUDENT VETERANS

New students who are eligible for educational benefits through the Veterans Administration should forward to the Office of Student Affairs a completed VA Form 22-1995 (Request for change of Program or Place of Training). Veterans who have not used any of their VA educational benefits should forward a completed VA Form 22-1990 (Application for Program of Education or Training) and a copy of DD 214 (Separation Papers) directly to the Office of Student Affairs of the School of Pharmacy.



Entry-Level Doctor of Pharmacy (Pharm.D.) Program

PROGRAM DESCRIPTION

The new Entry-Level Pharm.D. program is divided into six levels: Fundamentals, Basic Science, Pharmaceutical Science, Integrated Sciences and Therapeutics, Experiential Learning and a Curriculum-Practice Interface. The following describes the academic purpose of each level.

Level I - Fundamentals

Students entering the Doctor of Pharmacy program bring a wide diversity of education and life experiences. Level I includes courses to address these diversities by introducing students to the concept and scope of pharmaceutical care, pharmacy practice in general, the variety of disciplines that will contribute to their pharmaceutical education and skills, and scientific principles and concepts fundamental to subsequent curricular experiences.

Level II - Basic Science

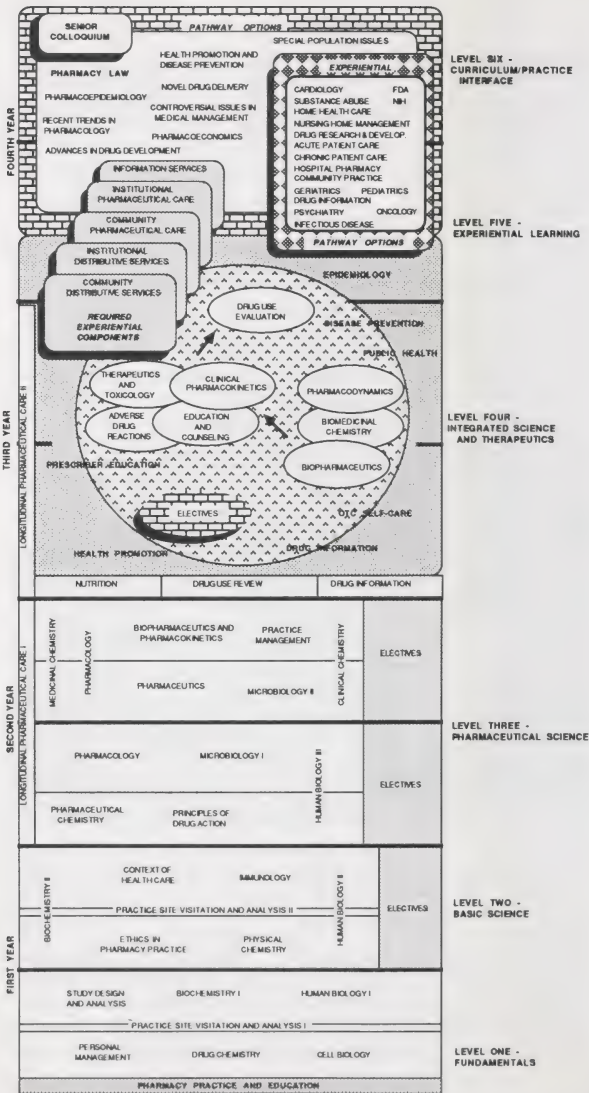
During Level II of the curriculum, students build on the fundamentals of Level I through a comprehensive examination of basic biological, chemical, physical, social and behavioral sciences. These elements provide the foundation for understanding pharmaceutical science and the complexities of drug action and use.

Level III: Pharmaceutical Science

The provider of pharmaceutical care must possess a detailed and comprehensive understanding of the physical, chemical, biological and psychosocial factors impacting on the outcomes of drug therapy in specific patients with specific diseases. Level III addresses pharmaceutical science content areas as they relate to the care of specific patients in the total health care environment.

Level IV: Integrated Sciences and Therapeutics

This forum addresses the extensive interweaving of basic and clinical science as well as the interrelated bodies of knowledge associated with the disciplines involved in total pharmaceutical care. Students build upon their basic and pharmaceutical science background as they actively participate in a variety of didactic and laboratory experiences to design, implement, manage and monitor individualized plans for pharmaceutical care. Students learn to appreciate that the successful outcomes of drug therapies relate to complex physical, chemical, biological and psychosocial interactions within human systems, and therefore require individualized attention to patients during the design



and delivery of pharmaceutical care. This application of integrated science to specific patients with specific diseases is presented within the broader context of public health, epidemiology, prescriber education, disease prevention and health promotion issues.

Three progressive components are used to present each topic. The **first** component reviews the drugs and biologicals used to treat specific disease processes and emphasizes comparative features underlying the choice of agent (Pharmacodynamics and Pharmacokinetics). Chemical properties, such as solubility and stability, that impact on the choice and use of the products, are discussed (Biomedical Chemistry and Pharmaceutics). The availability and comparative advantages of drug dosage formulations and delivery systems are considered as they relate to the optimum use of drug products during acute or chronic care (Biopharmaceutics).

The **second** component illustrates how the links between the scientific knowledge of the disease, available drug products and the variables underlying a particular patient's condition are important to developing the most appropriate therapeutic plan. Methods for the choice of drug products, definition of specific goals of therapy including the means to assess whether these goals are being achieved, and active intervention steps to ensure successful outcomes of drug therapy are developed (Therapeutics). Methods for monitoring, identifying and responding to untoward consequences of drug therapy are identified (Toxicology and Adverse Drug Reactions). The choice and design of specific acute and chronic drug therapy, the impact of a variety of patient-related variables on dosage regimens, and the modification of dosage regimens in response to changing patient needs, are developed (Clinical Pharmacokinetics). Students practice and develop skills in counseling patients about their therapeutic plans in particular, and providing health promotion education in general (Counseling and Education).

The **third** component links the knowledge base of the first two components with appropriate ongoing methods for drug use review, medical audits, and cost considerations. The emphasis is on identifying specific interventions to improve prescribing patterns and reduce the cost of health care (Drug Use Evaluation).

Level V: Experiential Learning

The Experiential Learning Program of the curriculum offers structured learning and training activities during which students interface directly with a variety of pharmacy practitioners in a variety of practice settings and environments. These activities, supervised by academic or preceptor faculty members, allow students to discover and practice application of accumulated factual knowledge and gain further integrative competence and confidence as they meld knowledge, skills and attitudes into pharmaceutical care behaviors underlying practice in a broad range of health care environments. An innovative feature of the curriculum is that experiential learning activities are linked to all eight semesters and are organized into six phases beginning with

an early introduction to pharmacy practice settings and culminating with extensive elective options.

Phase 1: Introduction to Professional Pharmacy Practice. This experience introduces the student to pharmacy practice settings, activities, and career opportunities. Activities in the first year of the curriculum provide students with an early exposure to cognitive and distributive pharmacy practice in community, institutional and non-traditional/specialty practice settings.

Phase 2: Longitudinal Pharmaceutical Care. During the second and third years of the curriculum, students observe and participate in the delivery of pharmaceutical care to patients in the context of total health care over time, including health care transitions. These activities provide the opportunity for students to link the health care/pharmaceutical care needs of patients with the material they are receiving in their didactic curriculum.

Phase 3: Distributive Services. Activities during this phase enable the student to competently perform the technical functions of drug dispensing and distribution in institutional and community pharmacy settings.

Phase 4: Pharmaceutical Care. Students obtain experience in the delivery of pharmaceutical care in institutional and community pharmacy practice settings. These experiences enable the student to learn and perform entry-level pharmaceutical care activities in the context of delivery of total pharmaceutical services.

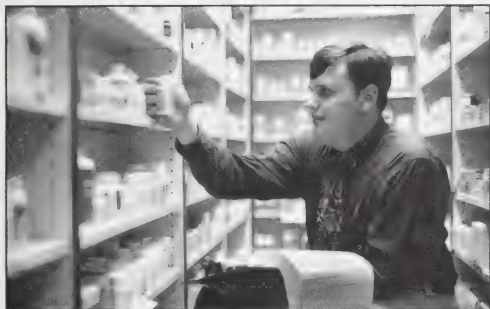
Phase 5: Informational Services. Students learn to provide drug information in the context of the delivery of pharmaceutical care in institutional, community, and specialty practice settings.

Phase 6: Elective Experiential Rotations. Elective experiential rotations provide students opportunities to pursue their own areas of interest by gaining in-depth experiences in specialty practices, non-traditional forms of pharmacy practice, management, research, etc. Elective experiential options are closely linked to student curriculum pathways.

A total of 32 credits of experiential learning experience (1500 clock hours) is required for the degree. All students complete 24 credits (1116 clock hours) of required rotations in independent and chain community pharmacy settings, hospital pharmacy, acute and chronic pharmaceutical care, ambulatory clinics and informational services. These rotations are supplemented with a minimum of 8 credits (384 clock hours) of elective experience in a variety of specialty, traditional and non-traditional settings including, for example, the Food and Drug Administration and the National Institutes of Health. All required and most elective rotations are designed to be completed within four weeks.

Successful completion of the experiential learning program is accepted by the Maryland Board of Pharmacy as meeting the internship requirements necessary for the licensure examination. With thoughtful personal, academic and financial planning, students are able to design a series of rotations to meet specific individual needs and curriculum pathway choices. Pre-

ceptors at rotation sites have faculty rank in the school. They are selected by the school and practice sites must achieve certain requirements to be accepted as a preceptor site. Student performance is evaluated by both the preceptor and the school. Experiential rotations are **not** permitted at a site where students are now working or have worked for payment or where the preceptor is a relative.



Level VI: Curriculum - Practice Interface

The sixth and final level of the curriculum contains a variety of educational experiences for the students about to enter practice. Required and elective content areas provide a curricular-based interface with pharmacy practice that builds on the preceding didactic and experiential components of the curriculum. The "capstone" nature of this interface will reflect the acquisition and appreciation of information that is on the cutting edge of pharmacy practice, that represents closing options for individual curricular pathways or that contributes to preparing students for a post-graduate education.

It is expected that the learning at the interface will be under continual change and development. One goal of this level is to allow each senior student, following completion of his or her experiential components, time to consider his or her individual practice in the context of the total health care environment. An important part of this interface, therefore, will be the opportunity for students to reflect interactively upon their educational experiences with fellow students, faculty and practitioners.

CURRICULUM PATHWAYS AND ELECTIVES

The central theme of the curriculum is basic or primary pharmaceutical care which encompasses the educational experiences common to all students in the program. All students must complete the required curriculum necessary to

prepare for the competent performance of entry-level pharmaceutical care in a variety of practice settings. To supplement the required curriculum, more than 21% (28 credits) of the four-year curriculum is reserved for didactic and experiential electives. This elective portion of the curriculum provides students the opportunity for flexible programming of their curriculum experience, or "curriculum pathway," in order to enhance their general practice of pharmaceutical care, to focus on a particular area of practice, or to prepare for post-graduate studies.

Students may select freely from elective options to design their pathway, or may choose one of several "model pathways." These models are designed to assist students in achieving common educational objectives in areas such as differentiated practice, pharmacotherapy, management or graduates studies. Students can choose one of the **differentiated practice pathways** for practice in a community or institutional activity or a setting of their choice. The **pharmacotherapy pathway** will provide courses for students interested in entering post-graduate residencies or fellowships for eventual board certification in pharmacotherapy. The **management pathway** provides background for management-oriented careers or for additional post-graduate training. Students choosing the **research pathway** will be better prepared for entry into graduate school or for post-graduate fellowships. Other model pathways may be developed in response to changing practice needs or student interest.

Faculty pathway coordinators, who design and maintain the integrity of the pathways, and faculty advisors will serve as consultants to students for information on career opportunities resulting from a particular pathway. Students have absolute free choice in choosing a pathway. Students not choosing a model pathway may select electives from any pathway as part of their elective options as long as the necessary prerequisites are met.



PROGRAM CURRICULA

Summary of Entry-Level Pharm.D. Program

Course Work	Minimum Semester Credits
Didactic	100 credits
Required	80
Elective	20
Experiential	32 credits
Required	24
Elective	8
Total	132 credits

Course Work By Semester¹

Semester One	Credits
PHAR 511: Biochemistry I	2
PHAR 512: Cell Biology	2
PHAR 513: Drug Chemistry	2
PHAR 514: Human Biology I	3
PHAR 515: Personal Management	2
PHAR 516: Pharmacy Practice & Education	3
PHAR 517: Study Design and Analysis	2
Total	16

Semester Two	Credits
PHAR 521: Biochemistry II	3
PHAR 522: Context of Health Care	3
PHAR 523: Ethics in Pharmacy Practice	1
PHAR 524: Human Biology II	3
PHAR 525: Immunology	2
PHAR 526: Physical Chemistry	2
PHPC 527: Introduction to Professional Practice	1
DIDACTIC ELECTIVES	2
Total	17

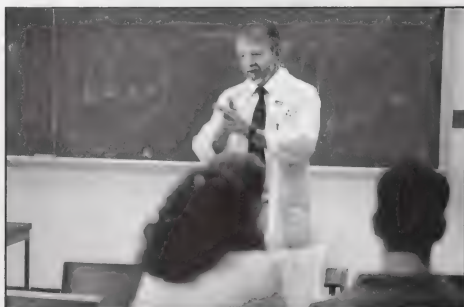
Semester Three	Credits
PHAR 531: Pharmaceutical Chemistry	2
PHAR 533: Microbiology I	2
PHAR 534: Human Biology III	3
PHAR 535: Pharmaceutics	3
PHAR 536: Pharmacology I	2
PHAR 537: Principles of Drug Action	2
PHPC 532: Longitudinal Pharmaceutical Care I	1
DIDACTIC ELECTIVES	2
Total	17

¹This outline is one suggested plan of study for electives. Electives can be taken during most fall, winter, spring and summer semesters.

Semester Four	
PHAR 541: Biopharmaceutics & Pharmacokinetics	2
PHAR 542: Clinical Chemistry	2
PHAR 543: Microbiology II	2
PHAR 544: Medicinal Chemistry	3
PHAR 545: Practice Management	2
PHAR 546: Pharmacology II	3
DIDACTIC ELECTIVES	2
Total	16

Semester Five	
PHAR 550: Medical Information Analysis	1
PHAR 551: Drug Use Review	1
PHAR 552: Principles of Human Nutrition	1
PHAR 554: Integrated Science and Therapeutics I	3
PHAR 555: Integrated Science and Therapeutics II	3
PHAR 556: Integrated Science and Therapeutics III	2
DIDACTIC ELECTIVES	4
Total	15

Semester Six	
PHAR 564: Integrated Science and Therapeutics IV	3
PHAR 565: Integrated Science and Therapeutics V	3
PHAR 566: Integrated Science and Therapeutics VI	2
PHPC 562: Longitudinal Pharmaceutical Care II	1
DIDACTIC ELECTIVES	6
Total	15

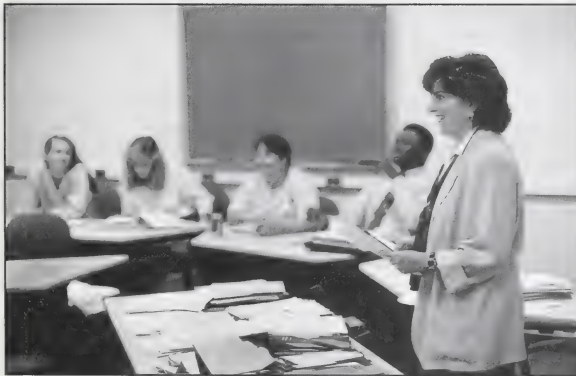


Semester Seven

PHPC 570: Community Distributive Services ²	3
PHPC 571: Hospital Distributive Services ²	3
PHPC 572: Institutional Pharmaceutical Care I	3
PHPC 573: Institutional Pharmaceutical Care II	3
PHPC 574: Community Pharmaceutical Care I	3
PHPC 575: Community Pharmaceutical Care II	3
PHPC 576: Ambulatory Clinic ¹	1
PHPC 577: Informational Services ¹	2
Total	21

Semester Eight

PHAR 580: Pharmacy Law	2
PHAR 581: Senior Colloquium	1
EXPERIENTIAL ELECTIVES ²	8
DIDACTIC ELECTIVE COURSES	4
Total	15

Grand Total**132 minimum credits**¹Taken concurrently with Pharmaceutical Care Rotations²Students complete these rotations at various times during the 3rd and 4th year, but register for them in these semesters.

COURSE DESCRIPTIONS

FIRST-YEAR COURSE DESCRIPTIONS

PHAR 511—Biochemistry I (2)—Fall Semester

PHAR 521—Biochemistry II (3)—Spring Semester. A course of study which builds on the principles of cell biology and genetics with a systematic consideration of the chemical components and requirements of living systems from the molecular to the cellular level. These fundamentals of biochemical structure, function, and energetics provide a platform for comprehension of pharmaceutical biotechnology, and for understanding determinants of disease, the pathobiochemistry of organ systems, mechanisms of drug action and adverse reactions, and novel drug delivery systems.

PHAR 512—Cell Biology (2)—Fall Semester. Introductory appreciation of the cell, the fundamental unit of the body. The integration of cell structure and molecular functions is developed with discussions of topics such as the history of modern biology; the basic principles of cellular cytoarchitecture and organization; membrane functions; biochemical structure, functions and energy conversion; cell-to-cell signaling; the flow of genetic information from DNA to RNA to proteins; cell division; human and Mendelian genetics; and human diversity.

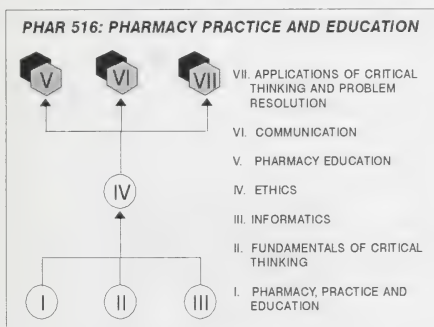
PHAR 513—Drug Chemistry (2)—Fall Semester. A study of the principles of organic chemistry that comprise basic elements of pharmaceutical science. The emphasis is on the relationship between molecular structure and chemical, physical, and biophysical properties of systems that arise from molecular interactions. The course provides a platform for comprehension of pharmaceutical concerns such as the stability of drugs and drug products, the conformation of bioactive proteins, the basis for drug-receptor interactions, the structure of biological membranes, and major drug classes.

PHAR 514—Human Biology I (3)—Fall Semester

PHAR 524—Human Biology II (3)—Spring Semester

PHAR 534—Human Biology III (3)—Fall Semester—Second Year. A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.

PHAR 515—Personal Management (2)—Fall Semester. An introduction to the basic elements of social and administrative science underlying the practice of pharmacy. The student is introduced to State and Federal laws including those related to negligence, standards of practice, and dispensing. Organizational theories of management and leadership styles are contrasted.



PHAR 516—Pharmacy Practice and Education (3)—Fall Semester. This prefatory course introduces the new Doctor of Pharmacy student to the science and profession of pharmacy. The evolution and implications of pharmaceutical care and the philosophical basis for the pharmacy curriculum are discussed. Students are introduced to skills necessary for success during the four year curriculum through the opportunity to critically evaluate problems, discuss ethical dilemmas, develop and apply computer and literature retrieval skills, and practice verbal and written communication skills. The importance of independent and cooperative learning activities is emphasized.

PHAR 517—Study Design and Analysis (2)—Fall Semester. Students are introduced to the pivotal role of study design and statistical analysis considerations in the design and evaluation of basic, clinical, epidemiological and social science research. The course focuses on the proper design of studies with emphasis on threats to internal validity and generalizability. A variety of descriptive and inferential statistical procedures and methods are surveyed with emphasis on the interpretation of the results of research.

PHAR 522—Context of Health Care (3)—Spring Semester. Students actively develop a contemporary definition of health care and critically examine the health care system with special emphasis on relevant legislation, traditional and nontraditional providers of health care, the organization and financing of health care delivery, and the dynamics of pharmaceutical care within the system. The social, legal and professional implications of informatics and computer proliferation in our society is discussed with special emphasis on pharmacy practice.

PHAR 523—Ethics In Pharmacy Practice (1)—Spring Semester. Introduction to the principles of ethical thinking. The philosophy of ethics and role of formal codes of professional conduct are discussed in the context of resolving conflicting ethical principals.



PHAR 525—Immunology (2)—Spring Semester. The natural and acquired protective mechanisms of the immune system are discussed with topics ranging from the structure, function, and specificity of antibodies; B-lymphocyte and T-lymphocyte functions; initiation and control of immune responses; histocompatibility; and immune-mediated disease. The course is designed to provide the student with sufficient knowledge of humoral and cellular immunity to understand the role of the immune system in disease, the production and use of vaccines and related biologicals, and the rapidly growing areas of transfusion, transplant and tumor immunology.

PHAR 526—Physical Chemistry (2)—Spring Semester. A study of selected principles of physical chemistry that comprise basic elements of pharmaceutical science. The emphasis is placed on the relationship between molecular structure and the physical and biophysical properties of systems that arise from molecular interactions. The goal of the course is to apply the principles of physical chemistry to the practice of pharmacy.

PHPC 527—Introduction to Professional Practice (1)—Spring Semester. Students observe cognitive and distributive pharmacy practice in community, institutional and non-traditional/specialty practice settings, and analyze the types of services provided and the personnel involved in the delivery of those services. Experience is gained in the basic elements of the technical aspects of drug distribution. These activities are closely linked to and are an extension of PHAR 516: Pharmacy Practice and Education.

SECOND-YEAR COURSE DESCRIPTIONS

PHAR 531—Pharmaceutical Chemistry (2)—Fall Semester. A presentation of the basic chemical principles underlying the activity, absorption, metabolism, excretion, physico-chemical properties and design of drug molecules, culminating in a discussion of drug classes.

PHPC 532: Longitudinal Pharmaceutical Care I (1)—Fall Semester. Students observe the delivery of pharmaceutical care to patients in the context of delivery of total health care over time, including health care transitions. Students have regularly scheduled encounters, structured by a pharmacy practitioner, with selected patients and prepare periodic health care status reports on their patients, including an assessment of their pharmaceutical care needs.

PHAR 533—Microbiology I (2)—Fall Semester

PHAR 543—Microbiology II (2)—Spring Semester. A systematic study of microbial morphology, biochemistry and physiology. Major classes of pathogenic bacteria, viruses, fungi and parasites are surveyed with emphasis on mechanisms of pathogenicity, virulence and resistance. Microbial genetics is discussed, including the role of this area in the development of modern molecular biology and biotechnology. The course prepares the student for study of the etiology and consequences of infectious disease, and the use of antibiotics and other biologicals for their treatment.

PHAR 535—Pharmaceutics (3)—Fall Semester. The application of fundamental principles and basic science knowledge to the multidimensional problems of the formulation, development, testing, production, distribution, and administration of safe, effective, stable and reliable drug delivery systems. These systems, ranging in sophistication from tablets and capsules to biodegradable implants, are discussed using a problem-based approach that focuses on the critical determinants for traditional and less-traditional routes of drug administration.

PHAR 536—Pharmacology I (2)—Fall Semester

PHAR 546—Pharmacology II (3)—Spring Semester. A systematic consideration of the molecular, cellular and organismic mechanisms of drug action, organized by major drug classes. This course of study provides knowl-

edge of the mechanisms of drug action underlying their use in the treatment of specific and general disease processes.

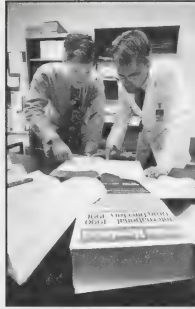
PHAR 537—Principles of Drug Action (2)—Fall Semester. A study of the chemical and biological concepts which apply to the characterization, evaluation and comparison of all drugs. Topics such as dose-response and receptor theory, receptor transduction mechanisms, pharmacologic selectivity, pharmacogenetic drug tolerance and dependence, drug allergy, drug resistance and chemical mutagenesis, carcinogenesis and teratogenesis are discussed at the molecular and cellular level. The physical, biological and chemical principles underlying drug absorption, distribution, biotransformation and excretion are discussed from the molecular to the organ level.

PHAR 541—Biopharmaceutics and Pharmacokinetics (2)—Spring Semester. The student learns how the processes of drug absorption, distribution, metabolism and excretion are coupled with dosage and the important parameters of clearance, volume of distribution and bioavailability, to determine the concentration of a drug at its sites of action in the body. The quantitative relationship between dose and effect is developed as a framework with which to interpret measurements of drug concentrations in biological fluids.

PHAR 542—Clinical Chemistry (2)—Spring Semester. Principles of analytical chemistry, clinical chemistry, enzyme assays, electrophoresis, radioactivity, magnetic resonance, biotechnology-based diagnostics and biosensors, and immunoassay are examined. Emphasis is on the application of these methods to the determination of drug concentrations in chemical and biological systems, and to health promotion and assessment. Students also have opportunities to examine patient data and use commercially available diagnostic kits.

PHAR 544—Medicinal Chemistry (3)—Spring Semester. A comprehensive study of the chemistry of drug products. The course outline follows the pharmacological classification of drug molecules, and includes discussion of chemical properties (physical and organic), stability, solubility, mechanisms of action where appropriate, and structure-activity relationships. Where possible, quantitative computer designed studies of drug development are mentioned.

PHAR 545—Practice Management (2)—Spring Semester. Management principles are provided to construct a practical framework for the operational management of a business of pharmacy. Elements addressed in this course include: controllable and uncontrollable variables in a free market economy, work flow analysis, accounting, budget development, purchasing, inventory control, quality assurance and third party reimbursement issues. The course also examines the current practical developments related to human resources management through integrating information on organization behavior, psychology, economics and law.



THIRD-YEAR COURSE DESCRIPTIONS

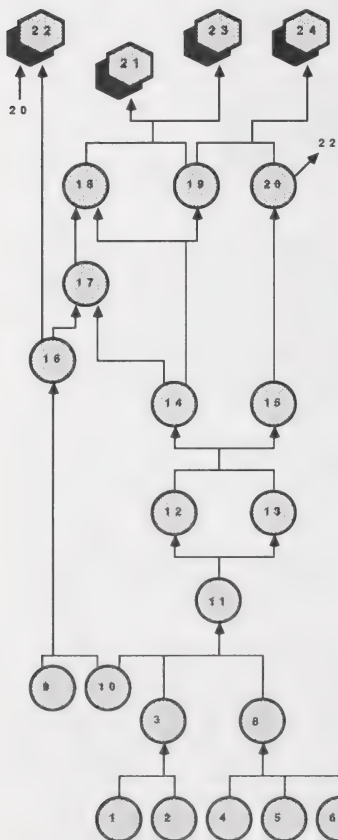
PHAR 550—Medical Information Analysis (1)—Fall Semester. A course designed to familiarize students with the process of information collection, retrieval, analysis and interpretation. A variety of topics surrounding drug information are covered including the drug approval process, role of drug information in the health care system, the biomedical publishing process, adverse drug reaction management, quality assurance and formulary management. The course also further develops and refines verbal and written communication skills through a variety of exercises.

PHAR 551—Drug Use Review (1)—Fall Semester. An examination of the review of physician prescribing, pharmacist dispensing, and patient use of drugs. A framework for this course is centered around the five steps of drug use review which include: determining optimal drug use through the process of criteria development; measuring or observing how drugs are actually used; comparing actual with optimal use and noting any differences; developing and implementing methods for effecting any change that is needed; and monitoring the results of the program.

PHAR 552—Principles of Human Nutrition (1)—Fall Semester. The basic principles of human nutrition are presented to prepare students to manage specialized nutritional support, provide appropriate dietary counseling for healthy people in different stages of the life cycle as well as for people with various diseases, and answer nutrition related questions. These principles are expanded and reinforced during the duration of Integrated Science and Therapeutics.

INTEGRATED SCIENCE AND THERAPEUTICS

Pharmaceutical Care



24. System Intervention
23. Prescriber Intervention
22. Population Intervention
21. Individual Patient Intervention
20. Due Assessment
19. Adverse Event Analysis
18. Patient Outcome Assessment
17. Patient Education
16. Health Promotion Plan
15. Due Criteria
14. Development of a Care Plan
13. Indices of Toxic Effects
12. Indices of Therapeutic Effect
11. Therapy Options
10. Financial Variables
9. Population Variables
8. Agent Variables
7. Biopharmaceutics
6. Applied Kinetics
5. Applied Chemistry
4. Applied Pharmacology
3. Patient Variables
2. Nutrition
1. Problem Definition & Assessment

PHAR 554, 555, 556—Integrated Science and Therapeutics I, II, III (3, 3, 2)—Fall Semester

PHAR 564, 565, 566—Integrated Science and Therapeutics IV, V, VI (3, 3, 2)—Spring Semester. Basic and clinical science faculty interact with students during a variety of didactic and laboratory experiences as students learn to design, implement and monitor pharmaceutical care plans for specific patients with specific diseases. Methods for the choice of drug product, definition of the specific goals of therapy including the means to assess whether these goals are being achieved, and active intervention steps at the patient, prescriber, health care system and population levels to ensure successful outcomes of drug therapy are developed. The courses are organized according to the major physiological systems of the human body, and the disease states commonly associated with them and encountered and observed by the pharmacy practitioner in a variety of community and institutional practice settings. A goal of these courses is to prepare our graduates to be better able to integrate new scientific knowledge into the successful pharmaceutical care of patients and the reduction of the cost of health care to patients and society. The knowledge and behaviors acquired during these courses prepare the student for the community and institutional pharmaceutical care rotations of the experiential learning program of the curriculum.

PHPC 562: Longitudinal Pharmaceutical Care II (1)—Spring Semester. A continuation of PHAR 532 as students continue to follow their patients with periodic encounters, and develop pharmaceutical care plans with special attention to the needs of health care transitions. These experiential activities are closely linked to the didactic activities in the Integrated Science and Therapeutics series of year three of the curriculum.





FOURTH-YEAR COURSE DESCRIPTIONS

PHPC 570—Community Distributive Services (3)

PHPC 571—Hospital Distributive Services (3). These rotations are ordinarily taken after the successful completion of the third year. One rotation may be taken during the Winter Session of the third year by full-time students in good academic standing.

Each rotation is a four week structured program of intensive skills development in the distributive aspects of community and institutional pharmacy practice to enable the student to competently perform the technical functions of drug dispensing and distribution. Students also learn the operational aspects of new drug distribution technology, the roles and methods of supervision of support personnel including methods for assuring drug distribution accuracy, and participate in the assessment and coordination of support personnel activities.

PHPC 572—Institutional Pharmaceutical Care I (3)—Prerequisite: PHAR 571: Institutional Distributive Services.

PHPC 573—Institutional Pharmaceutical Care II (3)—Prerequisite: PHAR 571: Institutional Distributive Services. Each four-week rotation allows students to obtain extensive experience in the development and implementation of pharmaceutical care plans including identification and assessment of drug therapy problems, establishing, implementing and monitoring plans, patient counseling, and intervention. Institutional pharmaceutical care sites are primarily those in which clinical and distributive services are linked to total pharmaceutical care. Pharmacy practitioners at these sites are primarily involved with delivery of patient-oriented services. Students participate in both the distributive and clinical aspects of these services with an emphasis on the processes, skills, and knowledge required to promote drug

therapy planning, intervention, and monitoring of patients in the context of a pharmacy service program.

PHPC 574—Community Pharmaceutical Care I (3)—Prerequisite: PHAR 570: Community Distributive Services.

PHPC 575—Community Pharmaceutical Care II (3)—Prerequisite: PHAR 570: Community Distributive Services. Each four-week rotation allows students to obtain extensive experience in the development and implementation of pharmaceutical care plans including identification and assessment of drug therapy problems, establishing, implementing and monitoring plans, patient counseling, and intervention. Community pharmaceutical care sites are primarily community pharmacies where clinical and distributive services are provided and preceptors have implemented pharmaceutical care service activities. Students participate in both the distributive and clinical aspects of these services with an emphasis on optimizing drug therapy regimens, provision of prescription and non-prescription drug therapy, monitoring for drug response and toxicity, patient counseling, and triage in the context of pharmacy services.

PHPC 576—Ambulatory Clinic (1). Students learn to assess patient's needs for drug therapy, assess current drug therapy, perform appropriate pharmacotherapy-oriented physical assessments, order appropriate laboratory tests, initiate and/or change drug therapy regimens, and conduct appropriate patient follow-up. Time is devoted to issues pertaining to applications of practice management concepts and skills. These activities run concurrently with the Pharmaceutical Care rotations (PHPC 572, 573, 574, & 575).

PHPC 577—Informational Services (2). Students learn how to conduct timely and accurate literature searches and evaluate sources of drug information. Students develop their own personal information library, have regularly scheduled responsibilities in an information center, participate in a regularly scheduled recitation session with a journal club format, and subscribe to an affordable abstracting service with specific assignments to review selected articles. This experience enables the student to provide drug information for the purposes of establishing accurate pharmaceutical care plans, for the performance of drug use evaluations, and for formulary decision making. These activities run concurrently with the Pharmaceutical Care rotations (PHPC 572, 573, 574, & 575).

PHAR 580—Pharmacy Law (2)—Fall Semester. An examination of the legal and regulatory issues pertaining to drugs and devices and the practice of pharmacy. Students learn the various laws and regulations which would govern their usual daily activities in a variety of practice sites.

PHAR 581—Senior Colloquium (1)—Spring Semester. Students deliver oral presentations to share some aspect of their educational experience, practice aspirations, or career goals with their student peers and the faculty. This forum facilitates discussions fostering a critical examination of each student's formal education in the context of the practice of pharmaceutical care.

ELECTIVE COURSES

The elective didactic (PHMY) and experiential (PHEX) courses currently offered by the School of Pharmacy are described below. In general, higher course numbers indicate courses with important prerequisite requirements, and are designed for later years of the curriculum. Prerequisites for most electives include consent of the instructor and the student's advisor.

PHMY 510—Advanced Educational Opportunities (1)—Var. terms. This elective program provides students who may be interested in graduate school or research careers with knowledge and information about various advanced educational opportunities in the curriculum. Aspects of careers which require advanced study are described by individuals in those career areas, and by students currently enrolled in them. Students enrolled in this course receive diverse perspectives relating to goals, training, functions, settings, and opportunities in research in the pharmaceutical sciences and pharmacy practice areas.

PHMY 518—Drug Abuse Education (1-3)—Fall and Spring Semesters. Practice and training in the dissemination of drug information, especially drug abuse information, to the public, linked to the activities of the Student Committee on Drug Abuse Education (SCODAE). Students complete a ten-hour training session, observe community education programs presented by SCODAE, present several programs, and prepare a written report on a timely topic in the area of chemical dependence.

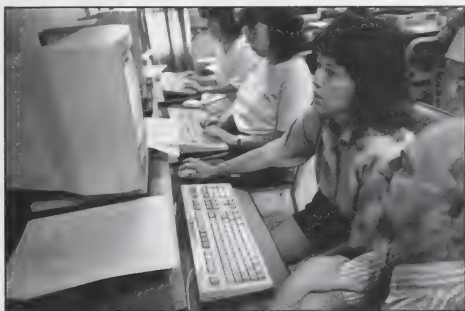
PHMY 521—History of Pharmacy (1)—Fall Semester. A course which explores the historical development of pharmacy practice and medicines.

PHMY 522—Business Plan Development (2)—Fall Semester. An elective course for students interested in ownership or management with emphasis on the practical problems associated with establishing a new business or expanding an existing enterprise. Location and market analysis, target marketing, revenue and expense projections, and estimation of capital requirements are among the topics covered.

PHMY 523—Advanced First Aid (3). Advanced first aid and emergency care including CPR.

PHMY 524—Computers and Their Applications to Pharmacy (2)—Fall Semester. An advanced course in using computer software. Students complete a series of computer-based projects that illustrate how software can be used to enhance various aspects of pharmacy practice.

PHMY 528—Selected Topics in Geriatrics and Gerontology (1-3). This course provides an educational experience through the investigation of the areas of geriatrics and gerontology with the school's Center for the Study of Pharmacy and Therapeutics for the Elderly. Includes Elder-Visitation during which students select an elderly person living in the community and follow that person. Guided discussions in school address problems/solutions to elder health care.



PHMY 529—Special Group Studies (var. 1-5). Repeatable up to 12 credits. An omnibus course permitting experimentation with new or different subject matter and/or instructional approaches.

PHMY 537—Clinical Aspects of Chemical Dependence (2)—Fall Semester. This course familiarizes students with the clinical aspects of chemical dependence. Special emphasis is placed on the pharmacology of commonly abused psychoactive substances and the role of pharmacological supports in the treatment of addiction.

PHMY 539—Special Projects (var. 1-3). Repeatable up to 12 credits. Independent investigations consisting of library or laboratory research, seminars, or other assignments appropriate to the problem investigated.

PHMY 541—Introduction to the Poison Center (1). The Maryland Poison Center, a division of the School of Pharmacy, provides emergency poison

information 24 hours a day to the general public and health professionals. The center serves an educational function for students at UMAB. Pharmacists play an extremely important role in the Poison Center's operation. This course provides students the opportunity to observe and be involved in a clinically oriented pharmacy practice setting early in their education. Students learn about the Poison Center's operation and resources and the potential for pharmacist participation in this area of patient care. The course consists of discussion sessions, activities in the Maryland Poison Center, role playing, and laboratories on toxicology resources and communication skills. Students present a home management and a hospital management drug overdose case.



PHMY 542—Cosmetics Preparations (2)—Fall and Spring Semesters. This course is designed to stimulate student thought in the field of cosmetic science and technology. Upon completion of the course, the student will be able to discern among the various health benefit claims made by cosmetic preparations, and help consumers select appropriate products. Historical perspectives, as well as modern concepts of cosmetic formulation, composition, manufacture, promotion, and utilization are presented. During laboratory sessions, ingredient functionality and manufacturing processes are discussed, and students prepare representative cosmetic formulations.

PHMY 543—Honors Seminar in Pharmacy Administration (1)—Fall Semester. A survey of current literature in the general area of pharmacy practice and administrative science. Each week, a recently published paper related to the economic, social, behavioral or education aspects of pharmacy is discussed and evaluated. Special student research projects may also be undertaken.

PHMY 550—Adverse Drug Reactions (2)—Fall Semester. Focus is on the clinical manifestations and incidence of drug reactions, systems affected, differentiation among idiosyncratic reactions, hypersensitivity reactions, extensions of pharmacologic action and assessment of drug reaction literature.

PHMY 551—Recent Advances in Pharmacology (1)—Fall Semester. The objective of this course is to present advances in pharmacology and toxicology. Sessions emphasize experimental and clinical findings, their interpretation and significance in relation to basic and applied aspects of pharmacology and toxicology. Attention is also given to experimental design and methodology of the studies in question.

PHMY 552—Pharmacology and Aging (1)—Spring Semester. This course presents advances in our understanding of variations in drug response in the aging population. The course is designed to give students an appreciation for the basic physiological and biomedical changes which normally occur with aging, and how these changes relate to altered pharmacodynamic and pharmacokinetic responses following drug administration. Basic and clinical pharmacologic studies are used to support the conclusions presented.

PHMY 553—Consumer Education Program for Older Adults (2)—Fall and Spring Semesters. The urgent need for pharmacists to become more involved with the health care of the elderly is well documented. This course trains students to educate the elderly about drugs and drug taking. Students benefit from the didactic and applied aspects of the course, since they must first learn about the special needs of the elderly and then actually interact with the elderly both in large groups and on a one-to-one basis.

PHMY 554—Health Education Seminar (2). Health education is the scientific process designed to promote the health of individuals and groups using educational strategies to achieve voluntary behavioral change. The objective of the course is to prepare students to become effective health educators to patients, other health practitioners and/or the community. The theoretical and conceptual frameworks upon which the discipline is based are fully developed. Students learn the techniques of behavioral and educational diagnosis and their application in the development of educational intervention.

PHMY 555—Novel Drug Delivery (2). A study of specialized formulations, dosage forms and drug delivery systems. The goal of the course is to enable students to make decisions about the appropriate use of novel drug delivery systems from an integrated science and practice perspective, basing the decisions on the physical, chemical, therapeutic, and economic attributes of these systems.

PHMY 556, 557—Advanced Pharmacology I, II (2,2)—Fall and Spring semesters. This course expands and extends the pharmacology material learned in the required courses PHAR 536 & 546. Discussion of the assigned topics and review of original papers represent a two-hour weekly session. These sessions include graduate students in Pharmaceutical Sciences/Pharmacology and Toxicology.

PHMY 560—The Pharmacist in the Critical Care Setting (1). Identifies and discusses the role of the pharmacist in various critical care settings. The student will be able to see how critical care pharmacy has evolved to complement the medical and nursing management of the critically ill patient.

PHMY 561—Advanced Therapeutics Seminar (3). An advanced course dealing with complex drug therapy decision-making utilizing case presentations and current literature. Requires active student participation in resolution of therapeutic controversies.

PHMY 562—Clinical Pharmacokinetics (2)—Spring Semester. Provides the student with the didactic training and skills necessary to conduct clinical pharmacokinetic consultation.

PHMY 563—Pharmacotherapeutic Issues in the Critically Ill Patient (2). This course is designed as an elective seminar for students interested in the area of critical care pharmacotherapy. Topics include a wide scope of disease states and drug issues frequently encountered in an ICU setting. The presentation of these topics will identify the pharmacologic aims and controversies in the management of a particular topic, while simultaneously underscoring the complexities of drug therapy in the critically ill patient which may lead to untoward reactions or suboptimal care.

PHMY 564, 565—Institutional Pharmacy I and II (2, 2)—Fall and Spring Semesters. Fundamentals of institutional pharmacy practice and administration with emphasis on hospital and nursing homes. Includes physical facilities, standards, purchasing, formulary implementation, record keeping, drug distribution and control systems.

PHMY 566—Orthotics Seminar (1)—Spring Semester. This course introduces students to the management of patients with orthopedic problems and prepares them with entry level skills to counsel and fit orthopedic appliances (orthoses). Fitting and educational techniques are demonstrated and students are trained in fitting a range of both rigid and flexible orthoses.

PHMY 567—Advanced Cardiac Life Support (2)—Spring Semester. This course focuses on the role of the pharmacist in the setting of cardiac arrest. A lecture format covers the pathophysiology, epidemiology, therapeutic goals

and treatment modalities in cardiac arrest as described by the Standards and Guidelines developed by the National Conference on Cardiopulmonary Resuscitation and Emergency Cardiac Care. Topics include the role of the pharmacist on the cardiac arrest team, an in-depth discussion of the role of pharmacologic intervention, techniques of basic and advanced cardiac life support and post-resuscitative care.



PHMY 570—Current Topics in Infectious Disease (1)—Spring Semester.

This course is intended to provide a forum for discussion of current and controversial aspects of infectious disease therapy. Each student selects a new or controversial areas of infectious disease therapeutics and prepares a one-hour lecture/discussion of that topic. Each student is expected to read selected background material and contribute to the discussion of the topic. Audiovisual aids and/or handouts are encouraged.

PHMY 571—Parenteral Therapy (2)—Spring Semester. A comprehensive review of all aspects of parenteral therapy including planning, organizing, and implementing an IV admixture program, preparation of sterile products, basic concepts of fluid balance and dosage state, blood products, parenteral nutrition, and chemotherapy and biotechnology products.

PHMY 574, 575—Pharmacotherapeutics I, II (2, 2). Pharmacotherapeutics I and II are courses in advanced therapeutic decision-making which parallel the therapeutic topics offered in the Integrated Science and Therapeutics modules during the third year of the curriculum. The courses require students to formulate therapeutic decisions based upon case materials and emphasize the process of decision-making in the presence of multiple patient and agent variables. As the number of cumulative therapeutic topics increases, the complexity of the decision making increases. Students are expected to incorporate

data from the primary literature as part of the therapeutic decision making process.

PHMY 580—Drugs and Public Policy (2)—Spring Semester. An examination of public policy issues related to drug use in our society. Cases, small group discussions and outside experts will be used to analyze contemporary issues effecting pharmacy and health care.

PHEX 550—Parenteral Nutrition (3). A clinical experience designed to provide students with knowledge and experience in the design and monitoring of parenteral nutrition therapy.

PHEX 551—Drug Information Clerkship (2). A clerkship designed to familiarize students with resources, develop their ability to search primary, secondary and tertiary sources, retrieve, analyze and interpret the medical literature, and to refine written and verbal communication skills.

PHEX 552—Poison Information (3). A clerkship in the Maryland Poison Center providing students experience in providing poison information and consultation in clinical toxicology.

PHEX 558—Ambulatory Care (1-3). This experiential rotation supplements PHPC 576: Ambulatory Clinic of the required curriculum. Students gain additional experience working in an interdisciplinary ambulatory health care delivery system with practicing clinical pharmacists and participating in the evaluation, implementation and monitoring of ambulatory clinic drug therapy.



PHEX 559—Research (1-3). Students, in collaboration with a faculty sponsor, actively pursue a research project. The project may be in any of the areas of expertise of the faculty which include biological, pharmacological, chemical, social, administrative, management and clinical science. The emphasis of the course is on the design and implementation of research methodology, and allowing students to obtain hands-on experience with research techniques.

PHEX 560—Inpatient Medicine (3). An experiential rotation designed to provide students with extensive experience in dealing with the drug therapy problems of hospitalized patients in general medical areas.

PHEX 562—Clinical Pharmacokinetics Clerkship (3). An experiential rotation providing education and training on adaptive control of drug therapy by integration of pharmacokinetics, pharmacodynamics, pathophysiology and patient data.

PHEX 563—586 (2 credits each)—Variable terms. Elective experiences in pharmacy subspecialty areas approved and designed by a site preceptor and the student's advisor.

PHEX 563—Administration

PHEX 564—Cardiology

PHEX 565—Critical Care/Shock Trauma

PHEX 566—Critical Care/MICU

PHEX 567—Diabetes Care Management

PHEX 570—Food and Drug Administration

PHEX 571—Gastrointestinal Surgery

PHEX 572—Geriatric Pharmacy Services

PHEX 573—Home Health Care

PHEX 574—Infectious Disease

PHEX 575—Infectious Disease/HIV

PHEX 576—Oncology



PHEX 577—Oncology/Infectious Disease

PHEX 580—Oncology/TPN

PHEX 581—Oncology/Research

PHEX 582—Pediatrics

PHEX 583—Radiopharmacy

PHEX 584—Chemical Dependence Treatment

PHEX 585—Chemical Dependence Research

PHEX 586—Veterinary Medicine

PHEX 589—Special Studies (2-3)—Repeatable up to 12. Omnibus course permitting development and experimentation with new experiential electives or additional subspecialty practice area elective rotations.

Academic Information

ACADEMIC SESSIONS

The School of Pharmacy operates on a four semester calendar. The fall term, four months long, begins immediately after Labor Day and runs to the Christmas recess. A three week Winter minimester in January allows students to avail themselves of tutorial services or elective courses. The spring term, four months long, begins the last week in January and extends to just before Memorial Day. Full-time students enrolled in Spring do not pay tuition and fees for the UMAB courses taken during the Winter minimester. Student must pay additional winter minimester tuition at other UM campuses. Students taking didactic courses at UMAB or other UM institutions must pay summer session tuition and fees.

REGISTRATION POLICIES

Cancellation of Registration

Students who register and subsequently decide not to attend the School of Pharmacy must provide written notice to the Office of Student Affairs before the first day of class. If this office has not received a request for cancellation by 4:30 p.m. on the day before classes begin, the university will assume that students plan to attend and that they accept their financial obligation.

Change in Registration

A special add/drop form used for all changes in registration should be obtained from the Office of Student Affairs. Students must consult with their academic advisor and obtain his/her signature on the add/drop form. The completed form must be returned to the Office of Student Affairs. There is no charge for a change in registration.



Students may not add a course after the first week of classes or drop a course after the midpoint of a particular course without written permission from the Office of Student Affairs. The grade of "F" is given for courses dropped after the midpoint in the course.

Late Registration

A late registration fee is charged to students who fail to complete registration by the specified time for regular registration (usually the day before the first day of classes).

Withdrawal from the University

Students forced to withdraw from the university before the end of a semester are eligible for partial refunds depending upon the date of withdrawal. To ensure such refunds, students must file withdrawal forms in the school's Office of Student Affairs. Failure to complete these forms will result in failing grades in all courses and forfeiture of the right to any refund.

GRADING SYSTEM

The School of Pharmacy uses the following grading system:

Grade	Interpretation	Point Value
A	Excellent	4
B	Good	3
C	Fair	2
D	Poor but Passing	1
P	Pass	0
F	Failure	0
I	Incomplete	Must be replaced by definite grade within one year
WD	Withdrawal	No grade is assigned.

When, for any reason, a course is repeated, the grade achieved in the repeated course replaces all previous grades in the same course.

SCHOLASTIC HONORS

Academic excellence is recognized during the fall and spring honor convocations. During the fall ceremony, academic achievement awards are given to students in all classes based on performance the preceding year. The leaders of student organizations are also recognized at this time. The Rho Chi Honor Society presents its annual book award to the student(s) having the highest academic marks. The School of Pharmacy Achievement Awards are pre-

mented to individuals who have brought honor to the school by their career achievements.

In the spring, the school honors its graduates. Those in the first tenth of the class graduate with "high honors" and those in the second tenth of the class with "honors." The faculty presents the achievement awards to members of the graduating class at the Spring Honors Convocation:

School of Pharmacy Gold Medal for General Excellence is awarded to the candidates who have attained the highest general average.

Certificates of Honor are given to the three students having the next highest general averages. (Only courses taken at the University of Maryland School of Pharmacy are considered in awarding these two honors.)

Andrew G. DuMez Award. In memory of Dr. Andrew G. DuMez, late dean and professor of pharmacy, Mrs. Andrew G. DuMez provided a gold medal which is awarded for superior proficiency in pharmacy.

Epsilon Alumnae Chapter, Lambda Kappa Sigma-Cole Award. This award, in memory of Dr. B. Olive Cole, former acting dean, is given for proficiency in pharmacy administration.

Kappa Chapter, Alpha Zeta Omega Fraternity Prize. The Kappa Chapter of the Maryland Alumni Chapter of the Alpha Zeta Omega (AZO) fraternity provides a prize which is awarded for proficiency in pharmacology.

Maryland Society of Hospital Pharmacists Award. MSHP honors annually the student who has been outstanding in the area of hospital pharmacy.

William Simon Memorial Prize. In honor of the late Dr. William Simon, who was a professor of chemistry in the School of Pharmacy for 30 years, a gold medal is awarded for superior work in the field of biomedical chemistry.

Dr. and Mrs. Frank J. Slama Scholarship Award. Mrs. Lillian Slama, widow of the late Dr. Frank J. Slama, a former professor of pharmacognosy, has provided a fund, the income of which provides a plaque to be awarded for superior work in the field of biopharmacognosy.

Frank J. Slama Award by the School's Alumni Association. In memory and tribute to the late Dr. Frank J. Slama, class of 1924, a former professor and head of the department of pharmacognosy, for his loyalty and service of over half a century to his profession, to the School of Pharmacy and to the Alumni Association, the School of Pharmacy Alumni Association provides an annual award to a member of the graduating class who has excelled in extra-curricular activities.

Wagner Pharmaceutical Jurisprudence Prize. In memory of her husband, Manuel B. Wagner, and her son, Howard J. Wagner, both alumni of the School of Pharmacy, the late Mrs. Sadie S. Wagner, together with her daughter, Mrs. Phyllis Wagner Brill Snyder, provided a fund, the income of which is awarded for meritorious academic achievement in pharmaceutical jurisprudence.



John F. Wannewetsch Memorial Prize. In memory of her late brother, Dr. John F. Wannewetsch, a distinguished alumnus of the School of Pharmacy, Mrs. Mary H. Wannewetsch provided a fund, the income of which is awarded to a student who has exhibited exceptional performance and promise in the practice of community pharmacy.

The Conrad L. Wich Pharmacognosy Prize. In appreciation of the assistance which the Maryland College of Pharmacy extended to him as a young man, Mr. Conrad L. Wich provided a fund, the income from which is awarded annually by the faculty assembly to the student who has done exceptional work throughout the course in pharmacognosy.

L. S. Williams Practical Pharmacy Prize. The late L. S. Williams left a trust fund, the income of which is awarded to the senior having the highest general average throughout the course in basic and applied pharmaceuticals.

ACADEMIC STATUS POLICIES

Students are responsible for their own academic progress. Conferences about course work should be arranged with coursemasters as soon as a problem arises. Each student is assigned an academic advisor, who should be consulted about program planning and/or academic problems. Each class is assigned a class advisor who not only helps coordinate the overall activities of the class, but also functions as an academic counselor on issues affecting the class as a whole.

The academic status of each student is reviewed at the end of each semester by the school's student affairs committee. The committee's recommendations and decisions are subject to the approval of the faculty assembly. To remain in good standing, students must maintain a cumulative grade point average of 2.0 or higher. Students who fail to maintain this average will be placed on probation during the next semester. Students with an "F" on their records will also be placed on probation.

Students who have been on probation for one semester and then obtain a probationary average for a second semester will have the following options, if allowed to continue in the program: (1) to continue in School of Pharmacy on a reduced load (less than 9 hours), or (2) to continue in school on a full load (9 hours or more) with the understanding that academic dismissal is mandatory should their **cumulative** grade point average still be below 2.0 at the end of the following semester. Students who fail one or more courses are eligible for academic dismissal. Students must have a cumulative grade point average of, at least, 2.0 in all required courses of the first two years in order to enter into the required program of the third professional year. Students cannot enter the third year while on probation or with an "F" in a required course. Students must maintain a cumulative grade average of 2.0 to become eligible for graduation.

REDUCED ACADEMIC LOAD POLICIES

Students who are on reduced load must complete their outstanding course work on a two-for-one basis, i.e., a maximum of two semesters to complete the equivalent of one semester on full load. An average of, at least, 2.0 must be earned in the courses students take while on reduced load. Failure to maintain this average in any one semester will result in academic dismissal. Students on reduced load must take advantage of tutorial assistance, if available. Failure to take advantage of tutorial assistance will be noted by the student affairs committee during its deliberation of students appeals. Students cannot enter their third or fourth professional year on reduced load. Students in the second professional year on a reduced load may take third and fourth professional year electives but may not take third and fourth year required didactic or experiential courses.

ACADEMIC DISMISSAL

Failure to meet the school's academic or professional standards will result in academic dismissal. To appeal academic dismissal, students must write to the student affairs committee; students have the right to present their case in person before the committee. The decision on the appeal is forwarded by the committee to the faculty assembly. If the appeal is denied, students have the right to appeal directly to the dean. The dean's decision on academic dismissal is final. The academic dismissal appears on the student's permanent record

following the dean's decision. All appeals must be completed before the beginning of the next semester. Students who have been academically dismissed once may petition the admissions committee for reinstatement after they have completed some form of remediation. Students who have been academically dismissed twice are not eligible for reinstatement.

ACADEMIC INTEGRITY

Students entering the profession of pharmacy are expected to have high standards of conduct. The school and university have drafted several policy statements (listed in the back of this catalog) which reflect expected standards of behavior.

Students engaging in academic dishonesty will be eligible for disciplinary action by the school's student grievance and discipline committee. The following definitions are provided to describe the most common types of academic dishonesty:

Cheating - using unauthorized notes, study aids or information from another individual during an examination.

Plagiarism - submitting work that, in part or in whole, is not entirely the student's own without attributing credit to correct sources.

Fabrication - presenting data that were gathered outside the guidelines defining the appropriate methods of collecting and generating data.

Falsification of records - altering documents affecting academic records; forging signatures; or falsifying any school or university document.

Aiding or abetting dishonesty - providing material or information to another person with the knowledge that it will be used inappropriately.

PROGRAM COMPLETION AND EMPLOYMENT

Employment opportunities for our B.S. and post-B.S. Pharm.D. graduates have been excellent, with almost all having jobs as soon as they graduate. Currently, 92% of our students complete the program within the normal time.

Administration and Faculty

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 Nina Watson, B.S.P., Kimborough Community Army Hospital
 Donald Way, B.S.P., North Arundel General Hospital
 C. Edwin Webb, Pharm.D., M.P.H. American Association of Colleges of
 Pharmacy
 Joann N. Wehnert, B.S.P., Nanticoke Memorial Hospital
 Michael Weinstein, B.S.P., The Apothecary
 Debra S. Weintraub, Pharm.D., Suburban Hospital
 Lewis E. Williams, B.S.P., York Hospital
 Thomas Williams, B.S.Pharm., Medical Center of Dundalk
 Thomas Wilson, B.S.P., Cape Drug

Deborah Winkel, M.A., Barre-National, Inc.
Jane Wuenstel, B.S.P., Washington Adventist Hospital
Ellen Yankellow, B.S.P., Rombro Health Services
Martin Yankellow, B.S.P., Rite Aid Pharmacy
Irvin Yospa, B.S.P., Family Pharmacy of Hampstead
Jonas J. Yousem, B.S.P., Wilde Lake Pharmacy
Faramarz Zarfeshanfard, B.S.P., Johns Hopkins Hospital

Policy Statements

FACULTY, STUDENT AND INSTITUTIONAL RIGHTS AND RESPONSIBILITIES FOR ACADEMIC INTEGRITY

Preamble

The academic enterprise is characterized by reasoned discussion between student and teacher, a mutual respect for the learning and teaching process, and intellectual honesty in the pursuit of new knowledge. By tradition, students and teachers have certain rights and responsibilities which they bring to the academic community. While the following statements do not imply a contract between the teacher or the institution and the student, they are nevertheless conventions which should be central to the learning and teaching process.

I. Faculty Rights and Responsibilities

- A. Faculty members shall share with students and administrators the responsibility for academic integrity.
- B. Faculty members shall enjoy freedom in the classroom to discuss subject matter reasonably related to the course. In turn, they have the responsibility to encourage free and honest inquiry and expression on the part of students.
- C. Faculty members, consistent with the principles of academic freedom, have the responsibility to present courses that are consistent with their descriptions in the catalog of the institution. In addition, faculty members have the obligation to make students aware of the expectations in the course, the evaluation procedures and the grading policy.
- D. Faculty members are obligated to evaluate students fairly, equitably and in a manner appropriate to the course and its objectives. Grades must be assigned without prejudice or bias.
- E. Faculty members shall make all reasonable efforts to prevent the occurrence of academic dishonesty through appropriate design and administration of assignments and examinations, careful safeguarding of course materials and examinations, and regular reassessment of evaluation procedures.
- F. When instances of academic dishonesty are suspected, faculty members shall have the responsibility to see that appropriate action is taken in accordance with institutional regulations.

II. Student Rights and Responsibilities

- A. Students share with faculty members and administrators the responsibility for academic integrity.
- B. Students have the right of free and honest inquiry and expression in their courses. In addition, students have the right to know the requirements

- of their courses and to know the manner in which they will be evaluated and graded.
- C. Students have the obligation to complete the requirements of their courses in the time and manner prescribed and to submit to evaluation of their work.
 - D. Students have the right to be evaluated fairly, equitably, and in a timely manner appropriate to the course and its objectives.
 - E. Students shall not submit as their own work any work which has been prepared by others. Outside assistance in the preparation of this work, such as librarian assistance, tutorial assistance, typing assistance or such special assistance as may be specified or approved by the appropriate faculty members, is allowed.
 - F. Students shall make all reasonable efforts to prevent the occurrence of academic dishonesty. They shall by their own example encourage academic integrity and shall themselves refrain from acts of cheating and plagiarism or other acts of academic dishonesty.
 - G. When instances of academic dishonesty are suspected, students shall have the right and responsibility to bring this to the attention of the faculty or other appropriate authority.

III. Institutional Responsibility

- A. Constituent institutions of the University of Maryland System shall take appropriate measures to foster academic integrity in the classroom.
- B. Each institution shall take steps to define acts of academic dishonesty, to ensure procedures for due process for students accused or suspected of acts of academic dishonesty, and to impose appropriate sanctions on students found to be guilty of acts of academic dishonesty.
- C. Students expelled or suspended for reasons of academic dishonesty by any institution in the University of Maryland System shall not be admissible to any other System institution if expelled, or during any period of suspension.

Approved, November 30, 1989 by the Board of Regents.

CONFIDENTIALITY AND DISCLOSURE OF STUDENT RECORDS

It is the policy of the University of Maryland at Baltimore to adhere to the Family Educational Rights and Privacy Act (Buckley Amendment). As such, it is the policy of the university (1) to permit students to inspect their education records, (2) to limit disclosure to others of personally identifiable information from education records without students' prior written consent and (3) to provide students the opportunity to seek correction of their education records where appropriate. Each school shall develop policies to ensure that this policy is implemented.

SCHEDULING OF ACADEMIC ASSIGNMENTS ON DATES OF RELIGIOUS OBSERVANCE

It is the policy of the University of Maryland at Baltimore to excuse the absence(s) of students that result from the observance of religious holidays. Students shall be given the opportunity, whenever feasible, to make up, within a reasonable time, any academic assignments that are missed due to individual participation in religious observances. Opportunities to make up missed academic assignments shall be timely and shall not interfere with the regular academic assignments of the student. Each school/academic unit shall adopt procedures to ensure implementation of this policy.

ELIGIBILITY TO REGISTER AT UMAB

A student may register at UMAB when the following conditions are met: (1) the student is accepted to UMAB, (2) the student has received approval from the unit academic administrator and (3) the student has demonstrated academic and financial eligibility.

REVIEW OF ALLEGED ARBITRARY AND CAPRICIOUS GRADING

It is the policy of the University of Maryland at Baltimore that students be provided a mechanism to review course grades that are alleged to be arbitrary or capricious. Each school/academic unit shall develop guidelines and procedures to provide a means for a student to seek review of course grades. These guidelines and procedures shall be published regularly in the appropriate media so that all faculty and students are informed about this policy.

THE UNIVERSITY OF MARYLAND POSITION ON ACTS OF VIOLENCE AND EXTREMISM WHICH ARE RACIALLY, ETHNICALLY, RELIGIOUSLY OR POLITICALLY MOTIVATED

The Board of Regents strongly condemns criminal acts of destruction or violence against the person or property of others. Individuals committing such acts at any campus or facility of the university will be subject to swift campus judicial and personnel action, including possible expulsion or termination, as well as possible state criminal proceedings.

SERVICE TO THOSE WITH INFECTIOUS DISEASES

It is the policy of the University of Maryland at Baltimore to provide education and training to students for the purpose of providing care and service to all persons. The institution will employ appropriate precautions to protect providers in a manner meeting the patients' or clients' requirements, yet pro-

protecting the interest of students and faculty participating in the provision of such care or service.

No student will be permitted to refuse to provide care or service to any assigned person in the absence of special circumstances placing the student at increased risk for an infectious disease. Any student who refuses to treat or serve an assigned person without prior consent of the school involved will be subject to penalties under appropriate academic procedures, such penalties to include suspension or dismissal.

HUMAN RELATIONS CODE SUMMARY

The University of Maryland at Baltimore has a Human Relations Code for use by the entire campus community. The code represents UMAB's commitment to human relations issues. The specific purposes of the code include:

1. Prevention or elimination of unlawful discrimination on the basis of race, color, creed, sex, sexual orientation, marital status, age, ancestry or national origin, physical or mental handicap, or exercise of rights secured by the First Amendment of the U.S. Constitution; and
2. Establishing a timely, effective grievance procedure as an alternative to more lengthy formal processes for resolution of human relations issues.

A Human Relations Committee was created to oversee the code. It is comprised of campus faculty, administrators and students and is advisory to the president of the campus. The committee may institute educational programs and provide an open forum on human relations issues. In addition, the committee is charged with maintaining a mediation, investigation and hearing process for specific complaints of discrimination brought by students, faculty or staff. The code describes the particulars of the hearing process. It is the intent of the code to provide a grievance procedure for an individual on campus who wants a cross-section of the campus community to investigate and mediate a problem without having to resort to complaints to external agencies such as the Maryland Commission on Human Relations, complaints under personnel rules or lawsuits.

Copies of the Human Relations Code are available in the dean's office, the student affairs and USGA offices in the Baltimore Student Union, and the human resources management and affirmative action offices in the administration building.

DISCLAIMER

No provision of this publication shall be construed as a contract between any applicant or student and the University of Maryland at Baltimore. The university reserves the right to change any admission or advancement requirement at any time. The university further reserves the right to ask a student to withdraw at any time when it is considered to be in the best interest of the university.

Student Right-to-Know and Campus Security Act Request

The Student Right-to-Know and Campus Security Act (Public Law 101-542, signed into federal law November 8, 1990), requires that the University of Maryland at Baltimore make readily available to its students and prospective students the information listed below.

Should you wish to obtain any of this information, please check the appropriate space(s), fill in your name, mailing address and UMAB school name, tear off this form and send it to:

University Office of Student Affairs
Attn: Student Right-to-Know Request
University of Maryland at Baltimore
Suite 336, Baltimore Student Union
621 West Lombard Street
Baltimore, MD 21201-1575

Complete and return this portion

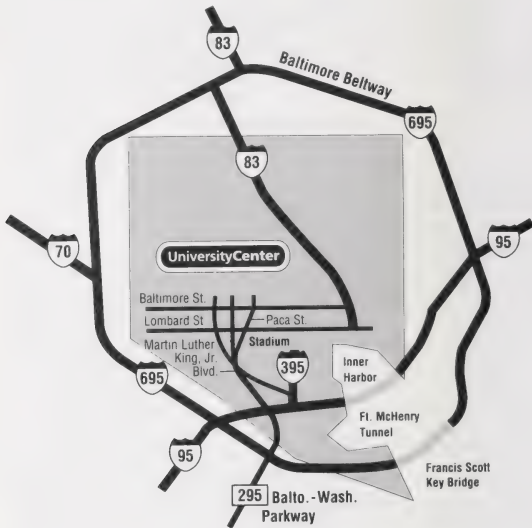
- Financial Aid
- Costs of Attending the University of Maryland at Baltimore
- Refund Policy
- Facilities and Services for Handicapped
- Procedures for Review of School and Campus Accreditation
- Completion/Graduation Rates for Undergraduate Students
- Loan Deferral under the Peace Corps and Domestic Volunteer Services Act
- Campus Safety and Security
- Campus Crime Statistics

Name _____

Address _____

UMAB School and Program _____

Campus Maps



TO REACH THE CAMPUS

The University of Maryland at Baltimore is located in UniversityCenter, a newly designated downtown Baltimore neighborhood, six blocks west of the Inner Harbor.

Directions

From I-95: Take Rte. 395 (downtown Baltimore) and exit onto Martin Luther King, Jr., Blvd., staying in right lane. At fourth traffic light, turn right onto Baltimore St.; turn left at second traffic light onto Paca St. and immediately into the Baltimore Grand Garage (visitor parking).

Bus Access

MTA buses numbered 1, 2, 7, 8, 9, 11, 20, 35, and 36 all stop in the campus area.

Subway Access

The Baltimore Metro runs from Charles Center to Owings Mills. Stops closest to campus are at Lexington Market and Charles Center.

Light Rail

A new light rail line connects Park and Ride locations at Timonium, Lutherville, Falls Road and Mt. Washington in northern Baltimore with the new Oriole Park at Camden Yards and continues south of Baltimore to Glen Burnie. The line passes two blocks east of the campus; the UniversityCenter stop is at Baltimore Street.

Academic and Patient Care Facilities

- 19 Administration Building
737 West Lombard Street
- 17 Allied Health Building
100 Penn Street
- 13 Athletic Center
646 Penn Street
- 12 Baltimore Student Union
621 West Lombard Street
- 37 Biomedical Research Building
108 North Greene Street
- 38 (Walter P.) Carter Center
630 West Fayette Street
- 7 Davidge Hall
522 West Lombard Street
- 31 Dental School
666 West Baltimore Street
- 22 Dunning Hall
636 West Lombard Street
- 8 East Hall
520 West Lombard Street
- 20 Environmental Health and Safety Building
714 West Lombard Street
- 1 James T. Frenkl Building
16 South Eutaw Street
- 6 Greene Street Building
29 South Greene Street
- 28 Health Sciences Facility (future)
- 10 Health Sciences Library
111 South Greene Street
- 42 Hope Lodge
636 West Lexington Street
- 26 Howard Hall
660 West Redwood Street
- 36 Information Services Building
100 North Greene Street
- 33 Law School and Marshall Law Library
500 West Baltimore Street
- 9 Lombard Building
511 West Lombard Street
- 35 Maryland Bar Center
520 West Fayette Street
- 18 Medical Biotechnology Center (future home)
- 27 Medical School
Frank C. Bressler Research Building
655 West Baltimore Street
- 29 Medical School Teaching Facility
10 South Pine Street
- 15 Nursing School
655 West Lombard Street
- 24 Parsons Hall
622 West Lombard Street
- 40 Pascault Row
651-655 West Lexington Street
- 30 Pharmacy School
20 North Pine Street
- 41 Pine Street Police Station
214 North Pine Street
- 39 Ronald McDonald House
635 West Lexington Street
- 5 Social Work School
525 West Redwood Street
- 14 State Medical Examiner's Building
111 Penn Street
- 4 University Plaza
Redwood and Greene Streets
- 21 Western Health Center
700 West Lombard Street
- 23 Whitehurst Hall
624 West Lombard Street
- 2 405 West Redwood Street Building
- 16 701 West Pratt Street Building
- 11 University Health Center
120 South Greene Street
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22 South Greene Street
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419 West Redwood Street
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Baltimore and Greene Streets

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VP Visitors Parking PP Patient Parking SP Student Parking





UNIVERSITY OF MARYLAND
AT BALTIMORE



SCHOOL OF PHARMACY

University of Maryland at Baltimore

1995-1996 Catalog



UNIVERSITY OF MARYLAND
AT BALTIMORE

School of Pharmacy
(Maryland College of Pharmacy: 1841 - 1904)

Doctor of Pharmacy (Pharm.D.) Program

1995-96 Catalog and 135th Announcement
for the Professional Degree Program

Volume 58, Number 1, September 1995

School of Pharmacy
University of Maryland at Baltimore
20 North Pine Street
Baltimore, MD 21201-1180

Admissions: (410)706-7653
or 1-800-852-2988 (Toll Free)

Admissions - Nontraditional Pathway: (410) 706-0761

Dean's Office: (410) 706-7650

Financial Aid (UMAB): (410) 706-7347

Public Affairs: (410) 706-5893

The University of Maryland at Baltimore is accredited by the Middle States Association of Colleges and Schools. The School of Pharmacy's Doctor of Pharmacy (Pharm.D.) programs and continuing education programs are accredited by the American Council on Pharmaceutical Education. For additional information, contact ACPE, 311 W. Superior St., Chicago, IL 60610 (312-664-3575). The school is a member of the American Association of Colleges of Pharmacy.

The University of Maryland at Baltimore is actively committed to providing equal educational and employment opportunity in all of its programs. It is the goal of the university to assure that women and minorities are equitably represented among the faculty, staff and administration of the university, so that its work force reflects the diversity of Maryland's population.

All employment policies and activities of the University of Maryland at Baltimore shall be consistent with federal and state laws, regulations and executive orders on nondiscrimination on the basis of race, color, religion, age ancestry or national origin, sex, sexual orientation, handicap, marital status and veteran status. Sexual harassment, as a form of sex discrimination, is prohibited among the work force of the university.



1995 - 1996
Catalog for the
Doctor of Pharmacy Program

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Introduction

In 1994, the School of Pharmacy consolidated its two professional entry-level programs (the B.S. in Pharmacy and post-B.S. Pharm.D. programs) into a single Doctor of Pharmacy program. This program was developed by the faculty after extensive analysis of pharmacy practice and education, with discussion and input from practitioners regarding the needs of the profession. Thus, the University of Maryland no longer offers the B.S. in Pharmacy and the traditional 2-year post-B.S. Pharm.D. program. Future pharmacists now gain entry into the pharmacy profession by completing the school's four year Doctor of Pharmacy program.

The school's Doctor of Pharmacy curriculum has inherent flexibility, allowing for change and restructuring of courses throughout the four year program. Most courses do not run an entire semester but are presented in shorter time frames so that the students can focus on three or four subjects rather than six or seven courses. This innovation allows more time for in-depth discussion of content areas. Other innovations include the optional pathways which offer avenues for specialization within an area of interest, such as pharmacotherapy or community practice, and the expanded opportunities to take electives—21 percent of the curriculum.

As a part of the 1994 curriculum revision, the school developed a **nontraditional pathway** so that licensed pharmacists in the region could earn the Doctor of Pharmacy degree. The goal of this pathway is to enhance the ability of pharmacists to provide pharmaceutical care within their current practice setting. Information on the nontraditional pathway is included toward the end of this catalog. Pharmacists interested in pursuing this pathway, however, are encouraged to read other sections of the catalog dealing with important school policies and procedures.

GOALS OF THE PROFESSION OF PHARMACY

Pharmacists are responsible for the drug-related needs of patients. The overall goal of every pharmacist is to assist patients, families and other health care providers in improving the health care outcomes of patients. Pharmacists advise, guide and help patients through the increasingly complex world of medications—whether in institutional or community practice settings or in the patient's own home. Consistent with our vision of pharmacy practice, the focus of our curriculum is to prepare well-trained, patient-oriented health care providers.

GOALS OF THE SCHOOL'S DOCTOR OF PHARMACY CURRICULUM

The goals and objectives of the Pharm.D. program are consistent with the school's strategic plan:



The School of Pharmacy seeks to provide individuals with the knowledge and skills necessary to begin pharmacy practice and, in so doing, accept and perform professional responsibilities with competence. Graduates should have the ability to adapt their practice to the changing health care system, and should be prepared to engage in a continuing program of professional development.

The professional curricula will be innovative and flexible, based on strong basic sciences, have extensive clinical content taught by practice-based faculty, and emphasize the development of problem solving and collaborative skills. The opportunity for advanced professional and clinical education will be made available.

The school seeks to create an educational community that extends beyond traditional classroom sites and offers students and faculty a variety of learning environments. These will include cultural and interprofessional programs which broaden the experiences of our graduates.

Curricular change within the school has been prompted, in part, by the adoption of the concept of **pharmaceutical care** by the practice of pharmacy. In the words of the AACP Commission to Implement Change in Pharmaceutical Education:

Pharmaceutical care focuses pharmacists' attitude, behaviors, commitments, concerns, ethics, functions, knowledge, responsibilities and skills on the provision of drug therapy with the goal of achieving definite outcomes toward the improvement of a patient's quality of life. These outcomes of drug use are: 1) cure of a disease; 2) elimination or reduction of symptoms; 3) arresting or slowing a disease process; 4) prevention of disease; 5) diagnosis of disease; and 6) desired alterations in physiological processes, all with minimum risk to patients.

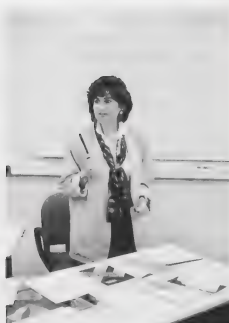
Historically the major patient-oriented, professional functions of pharmacy have involved preparing the drug product and providing it to the patient. These continue to be vital components. However, in response to the increasing effective-

ness, potency, preciseness, risk and cost of drug therapy and the increasing use of drugs in diagnosis, pharmacy has gone beyond those functions.

Thus the scope of contemporary pharmacy activities includes:

- providing drug information to patients and others;
- participating in the process of drug use decisions;
- monitoring patients to maximize compliance and to detect adverse events;
- monitoring patients to enhance therapeutic outcomes;
- selecting the drug product dosage form and source of supply;
- determining the dose and dosage schedule; and
- preparing the drug product for patient use and providing it to the patient.

The central goal of the Doctor of Pharmacy curriculum is to provide our graduates competency in the knowledge, attitudes, values and skills necessary to provide, coordinate and manage primary pharmaceutical care in collaboration with patients and their families, prescribers and other health care providers or care givers, in a variety of practice settings.



Dr. Hene Zuckerman

The School of Pharmacy

THE SCHOOL AND ITS HISTORY

The School of Pharmacy, University of Maryland at Baltimore has a rich and distinguished heritage. The school was first incorporated as the Maryland College of Pharmacy on January 27, 1841. The first classes were conducted in November of that year. It is the oldest pharmacy school in the South and the fourth oldest in the country. Primarily an independent institution until 1904, the Maryland College of Pharmacy then became the department of pharmacy of the University of Maryland. In 1920, the University of Maryland in Baltimore merged with the Maryland State College at College Park to form the state university. Today, the school is one of seven professional schools which form the University of Maryland at Baltimore (UMAB).

Throughout its history, the School of Pharmacy has been a local and national leader for the profession of pharmacy. It was a founding member of the American Association of Colleges of Pharmacy, which was established to formulate uniform standards for the graduation of pharmacy students. The school was instrumental in the development of the American Council for Pharmaceutical Education, the national accreditation organization for schools of pharmacy.

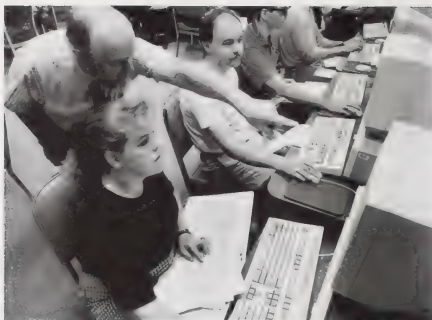
In 1970, through the efforts of the school and the Maryland Board of Pharmacy, Maryland became the first state to replace the unstructured internship program with a professional experience program incorporated in the school's curriculum. This set the national standard for professional pharmacy education. In 1980, Maryland became the first School of Pharmacy to establish a Center for the Study of Pharmacy and Therapeutics for the Elderly, now the national model for pharmacy geriatric education. In 1994, Maryland again became a benchmark for the nation by implementing its pace setting new Pharm.D. program.

COMMITMENT TO DIVERSITY

The school strives to achieve a broad racial, sexual and ethnic balance in its enrollment. To achieve this objective every consideration is given to minority student applicants. The current diversity of student population is reflected in 1995 enrollment statistics: 15 percent African American, 25 percent Asian, 52 percent Caucasian, 3 percent Hispanic, and 3 percent International students.

COMPLIANCE WITH ADA LEGISLATION

In accordance with the Americans with Disabilities Act of 1990, the School of Pharmacy examines all aspects of our programs and services to assure accessibility



to qualified students with disabilities. From recruitment to commencement, we recognize that we must strive to create an environment that respects student differences while challenging each person to perform to their optimal ability. Modifications to meet the needs of our diverse student population include offering applications, brochures, course materials and examinations in alternate formats; and modifying the length of time for completion of degree requirements. Equally as important, we review organizational activities that would prohibit participation by students with disabilities, and provide services for these students to assure their rights and protection under the law. With increased use of computer technology, we are able to make information more accessible and are better able to serve students with disabilities.

FACILITIES

The school moved to Pharmacy Hall, a seven-story facility on Pine Street, in 1982. Situated at the west entrance to the UMAB campus, Pharmacy Hall houses most of the classroom and lecture facilities, research laboratories, conference rooms and administrative offices for the School of Pharmacy. Pharmacy Hall also houses a Food and Drug Administration GMP(Good Manufacturing Practices) facility capable of producing drugs for human consumption.

The pharmacy practice and science department and the pharmaceutical sciences department's Pharmacokinetics-Biopharmaceutics Laboratory are located two blocks away in the five-story Allied Health Building which opened in 1992. Located at 100 Penn Street, it is located diagonally across from the Maryland Pharmacists Association offices in the Kelly Building at 650 West Lombard Street. School staff and faculty are also located in the Century Building at 506 West Fayette Street.

COMMUNITY AND PROFESSIONAL SERVICE/RESEARCH SUPPORT PROGRAMS

In addition to its degree programs, the School of Pharmacy, University of Maryland at Baltimore offers several community service and research support programs.

The School of Pharmacy **Academic Computing Laboratory** is located on the third floor of Pharmacy Hall. It has 18 computers for professional student and general use. There are two laser printers in the lab. The school has 303 computers—271 IBMs and 32 Macintosh—and 215 printers including 60 laser printers and one color laser. Most of these computers are hooked up to a Novell Local Area Network (LAN) to share files, software and to use electronic mail. Additional computers are located in the Swain Pharmacy Practice Laboratory, equipped with state of the art computers and pharmacy software for educational use.

The **Biomedical Chemistry NMR Center** houses a G.E. 300 MHZ nuclear magnetic resonance spectrometer. The superconducting magnet, the heart of the instrument, is permanently immersed in a vacuum-jacket reservoir of liquid helium (-260oC) and allows the detection and accurate determination of protons, ¹³C, ³¹P and other nuclei of biological importance. The first instrument of its kind on the UMAB campus, the NMR has opened up many new areas of research within the school, and greatly increasing the number of inter-school collaborative ventures.

The **Center on Drugs and Public Policy** is a cooperative program of the School of Pharmacy and the Policy Sciences Graduate Program, under the auspices of the University of Maryland Graduate School, Baltimore. The goal of the center is to contribute to informed debate of policy issues related to drug use and abuse in our society. In addition to conducting research on major drug policy issues, the center organizes conferences and workshops and serves as a consultant on drug issues to organizations in the private and public sectors. Fellowships or externships are available to professionals from industry, state and local agencies, foreign governments or universities who want a campus-based experience in drug-related policy research as well as an orientation to relevant agencies and organizations based in the Washington, D.C., and Baltimore areas.

The **Center for the Study of Pharmacy and Therapeutics for the Elderly** serves as the focal point of all geriatric education, service and research activities within the school. It provides continuing education programs both on the state and national levels. Funding from federal and private sources allows the center to encourage and support relevant research by faculty and graduate students from all school departments. The center is administratively responsible for the Elder-Health Program and the Parke-Davis Center for the Education of Elderly. The Parke-Davis Center for the Education of Elderly develops educational materials for use by the Elder Health and Elder-Ed programs. The Elder-Health Program informs pharmacy students and retired pharmacists about the social and psychological aspects of drug use among the elderly as well as the therapeutic goals of treatment for prescribed and over-the-counter medications. The students and retirees use the knowledge to give presentations to elderly members of the community.

The **Computational Chemistry Laboratory** is used for the study of biochemical systems via mathematical models. The goal of these studies is to allow for

an understanding of the relationship of the three-dimensional structure and dynamics of biological molecules to their physiological function. Such knowledge allows for a detailed analysis of the molecular basis of disease which may be used for the rational design of therapeutic agents. These approaches greatly increase the efficiency of the drug discovery process leading to significant savings of both time and money, which may ultimately be passed on to the consumer.

The **Drug Development Facility**, established as part of an ongoing multi-million dollar collaborative agreement with the Food and Drug Administration, is one of the most modern industrial and pharmaceutical technology research and manufacturing facilities in the country encompassing both state-of-the-art research facilities and a GMP (Good Manufacturing Practices) laboratory. Under the FDA contract, experimental clinical products are manufactured and tested for bioequivalence. In addition to FDA research, the Drug Development Facility accepts contracts from outside to develop and manufacture products for clinical studies. This Facility serves as an important resource for research as well as a teaching tool for advanced students.

The **Mass Spectrometry Laboratory** determines the structure of unknown chemicals and provides quantitative measurements of drugs and chemicals from a variety of sample sources. The laboratory's focus is on conducting both basic and applied research, increasing analytical services on the University of Maryland at Baltimore campus and supporting expanded mass spectrometry-related research activities in the larger scientific community.

The **Maryland Poison Center** serves as the regional poison center for the state of Maryland. As an emergency telephone service, it provides toxicity and treatment information on a 24-hour basis to the general public and to health professionals. Staffed by pharmacists and registered nurses, the center handles over 54,000 poison-related calls each year. It is an American Association of Poison Control Center certified regional poison center. University of Maryland at Baltimore health professional students work within the center. It serves as an educational site for both pharmacy students and medical residents.

The **Mental Health Program** of the School of Pharmacy is a joint venture with the Developmental Disabilities Administration and Mental Hygiene Administration of the state of Maryland. Its primary goal is to upgrade all aspects of pharmacy practice within the state's mental health facilities. The program also serves as a site for pharmacologic and administrative research in mental health, a testing ground for the development of innovative strategies in mental health pharmacy practice and a training resource for mental health-related issues. Members of the school's faculty serve at nine mental health sites around the state.

The **Office of Substance Abuse Studies** is responsible for the school's drug and alcohol abuse programs, including administration of the Student Committee on Drug Abuse Education (SCODAE), the operation of the drug abuse information telephone service and the publication of a quarterly newsletter, *PharmAlert*. SCODAE is a volunteer organization of pharmacy students who, with faculty support and guidance, are committed to the development of rational attitudes about drugs by serving as a source for accurate, unbiased drug information. Students present drug education lectures to a variety of groups, from elementary school children

to health and education professionals. The office administers the campus' inter-professional Drug and Alcohol Abuse Prevention Program and is instrumental in the operation of the Pharmacists Rehabilitation Committee, which is jointly sponsored by the Maryland Pharmacists Association, the Maryland Society of Hospital Pharmacists and the School of Pharmacy, University of Maryland at Baltimore.

STUDENT GOVERNMENT

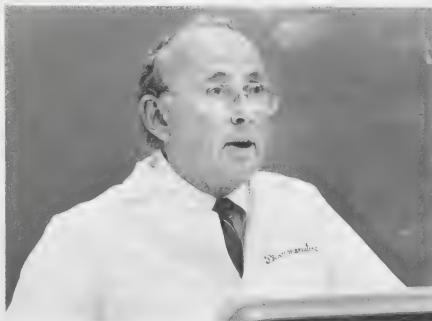
Student government activities are coordinated by the school's Student Government Alliance (SGA). Through its officers and committees, the SGA sponsors numerous social, service and educational events. All professional students belong to the SGA. The executive committee of SGA includes the presidents of all school organizations. This committee meets periodically with school administrators to discuss important issues. At the campus level, the University Student Government Association (USGA) coordinates student government activities. Students are represented by senators and officers elected by the UMAB schools.

LECTURE SERIES

The School of Pharmacy supplements its regular curriculum with special lectures and symposia.

Francis S. Balassone Memorial Lecture. The Maryland Pharmacists Association, the School of Pharmacy Alumni Association and the school sponsor this lectureship as a memorial to Francis S. Balassone, a 1940 graduate of the school, a past president of the Alumni Association, a distinguished former faculty member, and a past president of the National Association of Boards of Pharmacy.

Andrew G. DuMez Memorial Lecture. This lectureship was established in 1969 by Mrs. DuMez as a memorial to her late husband, Dr. Andrew G. DuMez. Dr. DuMez served as dean of the University of Maryland School of Pharmacy from



Dr. Ralph Shangraw



Dr. Peter P. Lamy

1926 to 1948, and was a distinguished educator and leader in pharmacy in Maryland, the United States and internationally.

Ellis Grollman Lecture in Pharmaceutical Sciences. In 1983, Mrs. Evelyn Grollman Glick funded a lecture program as a memorial to her brother, Ellis Grollman, a pharmacy school graduate in the class of 1926. Each year nationally recognized researchers in the pharmaceutical or related basic sciences are selected to present this lecture.

The **Peter P. Lamy Symposium** was inaugurated in 1992 in recognition of Dr. Lamy's career as an internationally-recognized authority on geriatrics and gerontology. This symposium provides an opportunity to discuss critical issues in the care of the nation's elderly.

Dean's Colloquium. The Dean's Colloquium brings together students, faculty, and nationally recognized scientists and clinicians to discuss contemporary issues of relevance to pharmacy and health care. These seminars provide unique opportunities for interaction and exchange of new information on topics related to pharmacy practice and science.

ENDOWED CHAIRS

The **Emerson Professorship in Pharmacology** was endowed in 1927 as a chair in Biological Testing and Assay by Captain Isaac Emerson, president of the Emerson Drug Company. The first chair was filled by Dr. Marvin Thompson who was a pharmacologist at the Food and Drug Administration at the time. Dr. Clifford W. Chapman, a pharmacologist from the Canadian National Laboratories was appointed to the chair in 1938. Dr. Casimer Ichniowski and Dr. Naim Khazan were the third and fourth appointees to the chair. In 1988, Dr. Gerald M. Rosen was appointed Emerson Professor. Because of his appointment, Dr. Rosen was named an Eminent Scholar from the Maryland Higher Education Commission.

The Parke-Davis Chair in Geriatric Pharmacotherapy was established in 1990 by a \$1 million gift from Warner-Lambert Company on the eve of the 125th Anniversary of Parke-Davis and the School of Pharmacy's 150th Anniversary. The endowment will underwrite the school's continuing commitment to geriatric pharmacotherapy as exemplified by the accomplishments of the late Peter P. Lamy, the first holder of the chair.

ALUMNI ASSOCIATION

The Alumni Association of the University of Maryland School of Pharmacy, established in 1926, encourages fellowship among its members, and promotes superior scholarship in the University of Maryland students and graduates. Each year the association sponsors a spring banquet honoring the graduating seniors and the 50-year class. The Alumni Association also awards eight scholarships based on need to deserving students. Three of these scholarships are named in memory of honored alumni: William J. Lowry, Henry G. Seidman and Alex Weiner. Additionally, the Alumni Association sponsors the quarterly *Rx Newsletter*, and plays a leadership role in the fund raising activities of the school. Many members participate in the annual phonathon and are generous donors to the David Stewart Associates and the University System President's Club.

DAVID STEWART ASSOCIATES

The School of Pharmacy traces its beginnings to a man with a vision—David Stewart. Civic leader, chemist and pharmacist, Stewart was instrumental in founding the Maryland College of Pharmacy in 1841 and, in 1884, the college elected him to the first chair in pharmacy in the United States. In his honor the school has named its major annual giving club the David Stewart Associates. Alumni, friends and faculty who contribute \$1,000 to the school annually are enrolled. The membership within David Stewart Associates now exceeds 75. For more information please contact the development office at (410) 706-8475.

University of Maryland at Baltimore

THE CAMPUS

The University of Maryland at Baltimore is the founding campus of Maryland's public university system and a thriving center for life sciences research and community service. Six professional schools and a graduate school educate research scientists and many of the region's health care, law and social work practitioners.

With \$114 million in sponsored program support, UMAB is one of the fastest growing biomedical research centers in the country. The university is ideally configured to tackle complex health care, public policy and societal issues. Our urban location and unique combination of strengths create opportunities to address regional problems in a comprehensive way. The solutions can have global implications. AIDS, aging, schizophrenia, hypertension, lead poisoning, cancer, child abuse and homelessness all are subjects of multidisciplinary research, scholarship and community action.

New partnerships among university components and with the University of Maryland Medical System and Baltimore Veterans Affairs Medical Center are strengthening interdisciplinary endeavors in both research and teaching. Our location, within the Baltimore-Washington-Annapolis triangle, maximizes opportunities for collaboration with government agencies, health care institutions and life sciences industries.

HEALTH SCIENCES LIBRARY

The Health Sciences Library is distinguished as the first library established by a medical school in the United States, and is a recognized leader in state-of-the-art information technology. The Health Sciences Library is the regional medical library for 10 southeastern states, the District of Columbia, Puerto Rico and the Virgin Islands as part of the biomedical information network of the National Library of Medicine.

Serving all schools on campus and UMMS, the library contains more than 300,000 volumes, including over 2,900 current journal titles, and is ranked in size among the top 25 health sciences libraries in the country.

The library's online catalog allows users to look for materials by title, author, subject, keyword, call number, series, meeting and organization name. In addition to giving information on library holdings, the system can determine whether the material has been checked out of the library. The online catalog can be accessed from any computer terminal on the UMAB campus that is linked to the campus network, or from any dial access terminal.

The library supports several computerized search services:

CD-ROM LAN—Available in the Health Sciences Library and through the campus network, the LAN contains the following databases: IPA (International Pharmaceutical Abstracts), Bioethicsline, HAPI (Health and Psychosocial Instruments), PsycLIT (database of psychological literature from the last 17 years), CINAHL (Cumulative Index to Nursing and Allied Health Literature), SWAB (social work abstracts), MicroCat (Maryland Union List of book/journal materials), Computer Select (information, including full-text of articles, concerning computers), VICTOR (University of Maryland at Baltimore online catalog) and Books in Print.

HSL Current Contents—recent citations from sections of the print Current Contents publications (Life Sciences; Clinical Medicine, Physical Sciences, Social and Behavioral Sciences and Engineering).

MaryMed Plus—User-friendly access to the full Medline database. It is available for use in the library, through dial-in or over the campus network. Free passwords are available for students.

Mediated Searching Service—Working with users, database searches are conducted by trained information specialists who have access to over 200 databases.

Micromedex CCIS—The Current Clinical Information Service provides full-text drug and clinical care information. This database is available in the Health Sciences Library and through dial-in or network access across the campus.

Information specialists assist with search service selection and research project planning. Seminars offered throughout the year acquaint students, faculty and staff with databases, services and information access and management possibilities.





COMPUTER RESOURCES

Computing support for faculty, staff and students is provided for microcomputer, workstation and mainframe computer users by Academic Computing/Health Informatics (ACHI) and by the Computing and Instructional Development Services (CIDS). Both are units of UMAB's Information Services (IS). CIDS is part of the Health Sciences Library's (HSL) Information and Instructional Services.

UMAB students and faculty are able to use IS resources at each step in their research, learning and teaching; this may include data collection, results analysis and document preparation, including desktop publishing, color printing and preparation of overheads or color slides. Free electronic mail accounts enable the UMAB community to exchange notes, files and documents with others at the university and internationally via either BITNET or Internet. Access to many campus information sources and the Internet is provided through a campus gopher server named UMABNET. Microcomputers are located in several Technology Assisted Learning (TAL) centers and in user areas in both the IS building (100 North Greene Street) and the HSL (111 South Greene Street). Centrally located systems in IS and HSL are accessible via the campus ethernet and by dial-up modems from either office or home. TAL Centers are available for use by the campus community and for application program training.

CIDS and ACHI support training that ranges from microcomputer literacy and microcomputer boot camp to more advanced classes for word processing, graphics, desktop publishing, multimedia and statistical application programs. Training for access to the Internet, network resources, and e-mail packages is also available. For information, call 706-HELP.

STUDENT AND EMPLOYEE HEALTH

Student and Employee Health provides comprehensive care to UMAB students. It is located in suite 160 of the University of Maryland Professional Building, 419 West Redwood Street. The office, staffed by family physicians, nurses and nurse practitioners, is open for regular appointments from 8:30 a.m. to 3:30 p.m., Monday through Friday. Students can also be seen until 7 p.m., Monday through Thursday, and Saturday, 8:30 a.m. to noon (for emergencies only), at University Family Practice, 29 South Paca Street.

Patients are seen by appointment only (call 328-6009), although true emergencies can be seen on a walk-in basis. A doctor can be reached after hours and on weekends by calling 328-6790 or 328-5140.

Gynecological services, including health maintenance (Pap smears, etc.), family planning and routine procedures, are provided by appointment with either the family physicians or the nurse practitioners. Birth control pills are available at a reduced cost for students receiving their GYN care through Student and Employee Health.

All full-time students are required to have health insurance. An excellent insurance policy is available through UMAB that provides wide coverage, including obstetrical care. The cost of most of the care provided at Student and Employee Health is paid for through the student health fee.

Hepatitis B is an occupational illness for health care providers. It has serious consequences and can even be fatal. Immunization against hepatitis B is required for medical, dental, dental hygiene, nursing, medical technology and PharmD students. The series of three immunizations is given through Student and Employee Health.

COUNSELING CENTER

The Counseling Center provides professional individual and group counseling to UMAB students. Some of the problems that students seek help with include: stress, relationships, drugs or alcohol, eating disorders, loss of a loved one and stressful changes in school or home life.

Students are always seen by a professional—social worker, psychologist, psychiatrist or addictions counselor. Costs associated with seeing a therapist usually are covered by health insurance; however, no one is ever denied services based on ability to pay. Students are seen by appointment (328-8404) and students' class schedules can be accommodated in scheduling appointments. All Counseling Center services are completely confidential. The Counseling Center is located in the Baltimore Student Union, 621 West Lombard Street, Suite 218.

ATHLETIC CENTER

The UMAB Athletic Center, on the tenth floor of the Pratt Street Garage, is equipped with a squash court; two handball/racquetball courts; two basketball courts which are also used for volleyball; and a weight room with two 15-station universal gyms, stationary bikes and rowing machines. Men's and women's locker rooms each have a sauna and showers.

Men's basketball, co-ed intramural basketball and volleyball teams compete throughout the fall and spring semesters. Squash and racquetball tournaments also are held in the facility.

PARKING AND TRANSPORTATION

On-campus parking is available to students. If you commute, you will first have to get a parking permit (the cost is \$1), which allows you to park on the UMAB campus, but does not guarantee you a space. Commuters can park at the Lexington Garage and Koesters Lot (Lexington and Pine Streets) at the current student rate of \$3.50 per day on a first-come, first-served basis. If spaces are unavailable, students will be directed to other lots.

Students who live in on-campus housing pay for parking by the semester or year and are guaranteed 24-hour parking in a garage adjacent to their residence facility. For more information about parking on campus, write Parking and Commuter Services, University of Maryland at Baltimore, Baltimore, Maryland 21201 or call 410-706-6603.

UMAB sponsors the "UMAB Caravan," a shuttle bus service that transports students from designated areas on campus to the main parking facilities and into the neighborhoods that are located south, east and west of campus. The service is free to students, faculty and staff, but you must show your UMAB ID to ride. Call the office of student affairs for times and routes at 706-7117.

Public transportation makes the campus accessible by bus, subway and light rail. Eight MTA bus routes stop in the campus area. The Baltimore Metro runs from Charles Center to Owings Mills. Stops closest to campus are at Lexington Market and Charles Center. A new Light Rail line connects northern Baltimore County with Oriole Park at Camden Yards and then south of Baltimore to Glen Burnie. The UniversityCenter stop is at Baltimore Street. MARC commuter train service runs from Camden Station, 301 West Camden Street.

LIVING IN BALTIMORE

Baltimore's a fun, friendly city with many affordable and convenient housing options. The brochure Living In Baltimore describes on- and off-campus options for UMAB students; it is available through most UMAB admissions offices or by calling the office of student life at 410-706-7766.

On-campus living options include furnished university-owned apartments and dormitory style accommodations plus unfurnished apartments in a half-dozen privately owned loft district buildings on campus. The Baltimore Student Union and Pascault Row Apartments are the two university-owned on-campus housing complexes.

Many students choose to live in neighborhoods surrounding the UMAB campus. A wide range of rooms, apartments and home rentals are available throughout the metropolitan area. The office of student life, located in the Baltimore Student Union, keeps a listing of available rooms and apartments.

THE CITY OF BALTIMORE

In addition to professional opportunities, the city of Baltimore offers a stimulating environment in which to live and study. Several blocks from the campus is the nationally acclaimed Inner Harbor area, where Harborplace, the National Aquarium, the Maryland Science Center and other facilities share an attractive waterfront with sailboats, hotels, restaurants and renovated townhouses. The new Baltimore Metro and Light Rail system connect the downtown area to the outskirts of the city.

Baltimore boasts lively entertainment, world class museums, fine music and professional theater. For sports fans, Baltimore features Orioles baseball (the new stadium is two blocks from campus) and league-winning lacrosse. The nearby Chesapeake Bay offers unparalleled water sports and the seafood for which the region is famous.

CLOSE PROXIMITY TO WASHINGTON, D.C.

UMAB is located 50 miles north of the nation's capital—home for many national professional organizations, including the American Association of Colleges of Pharmacy and the American Pharmaceutical Association. The school's close proximity to the District of Columbia offers numerous opportunities for students and faculty to participate in health care policy and research. Many students complete their experiential rotations with these organization and associations. A center for world economic, political and cultural developments, Washington also provides a wealth of research sources such as the Library of Congress and the National Library of Medicine.

There are countless site seeing opportunities in the city of monuments, memorials and museums. Visitors frequent historic landmarks such as the Capitol building, the White House and Ford's Theater, or spend hours strolling through the Smithsonian Museums or the National Zoo. There is a lot to see and do in Washington, and a reliable public transportation system to get you around.

Application and Admissions Information

APPLICATION PROCEDURES

Application forms will be available in September 1995 for the 96-97 academic year. To obtain an application and other information write:

School of Pharmacy
University of Maryland at Baltimore
20 North Pine Street
Baltimore, MD 21201-1180
ATTN- ADMISSIONS

B.S. Pharmacists interested in receiving applications to the nontraditional pathway should write: ATTN-NONTRADITIONAL PATHWAY on the envelope.

Applicants may also call:

(410) 706-7653 or

(410) 706-0761 for the nontraditional pathway (for B.S. pharmacists only)

Applicants must submit: (1) a completed application, (2) supporting documents and (3) a \$40.00 application fee, directly to:

Office of Records and Registration
University of Maryland at Baltimore
621 West Lombard Street
Baltimore, MD 21201

Those seeking advanced degrees (M.S. and Ph.D.) through the school must apply to: University of Maryland Graduate School, Baltimore, 5401 Wilkens Ave., Baltimore, MD 21228. For information on the school's master of science (M.S.) or doctor of philosophy (Ph.D.) graduate programs please write:

Graduate Programs - * specific discipline *
University of Maryland
School of Pharmacy
20 North Pine Street
Baltimore, MD 21201-1180

*Please specify the pharmacy graduate program to which you wish to apply: biomedical chemistry, pharmacology and toxicology, pharmaceuticals or pharmacy administration.



Ann Bonaparte assists a student with application

ADMISSIONS PROCESS

(Applicants for the nontraditional pathway please refer to the admissions section following the description of the pathway)

Application deadlines for admission are:

February 1, 1996

Application

March 1, 1996

All supporting documents

To be considered for admission to the program, applicants must take the Pharmacy College Admission Test (PCAT) and forward their scores to the school. Applications for the PCAT exam are available from the school's student affairs office. The PCAT is given in October, February and April, however applicants must complete the October and/or February exams to be considered for fall admission.

An admissions committee comprised of faculty and students reviews PCAT results and official transcripts to make admissions decisions. Applicants with strong PCAT and academic credentials are invited to interview with faculty and students. During the interview, factors such as professional and social awareness, verbal and written communication skills, integrity, maturity and motivation are assessed. Following the interview, the admissions committee makes a decision based on the applicant's academic achievement, scores on the PCAT and qualities evaluated during the interview. Academic achievement and/or high scores on the PCAT do not, in themselves, ensure acceptance.

While a minimum grade point average (GPA) of 2.5 (A=4.0) is required for application consideration, the average entering GPA of the fall 1995 first year Pharm.D. students was 3.5. Average PCAT scores of admitted students were above the 75th percentile in each of the five areas of the exam. Admission is competitive, and applicants with GPAs below 2.9 have an extremely low probability of acceptance.

Applicants must present evidence (via official transcripts) of having completed the prepharmacy coursework with grades of at least a "C", or being able to complete the prepharmacy coursework before the start of classes in the fall.

PREREQUISITES

A minimum of 60 semester hours of pharmacy prerequisites is required for admission into the Pharm.D. program. At least one semester of this coursework must be taken at an accredited institution in the United States. To enroll in prepharmacy course work, students must apply directly to an accredited college or university, **not** to the School of Pharmacy. Most institutions have designated prepharmacy programs and advisors. *The School of Pharmacy does not provide any specific information regarding course content and/or requirements for admission into these prepharmacy programs.* Prerequisites for admission into the Pharm.D. program are:

Course	Minimum Number of Semesters Required
English	2
Math (Precalculus/Calculus I)	Up to Calculus I
Zoology or Biology	1
General Chemistry	2
Organic Chemistry	2
Physics	2
Humanities and Social Sciences	About 18 hours to a minimum total of 60 hours

INTERNATIONAL STUDENTS

Students who are not citizens or permanent residents of the United States must submit the results of the TOEFL (Test of English as a Foreign Language), certified official copies of transcripts, a statement of financial support, a supplementary information sheet and a summary of educational experiences. These must be submitted with the application and the \$40 application fee to the office of records and registration. International students are also required to take the Pharmacy College Admissions Test (PCAT). Therefore it is essential that international students start the admissions process early.

The school does not accept applicants who have attended **only** a foreign educational institution. The school, due to its small size, cannot adequately certify international credentials and relies on the evaluation performed by other institutions. In addition, experience shows that international students benefit from taking courses at other U.S. institutions before entering our program. International

students should be familiar with the rules and regulations of the Immigration and Naturalization Service, which grants admission to the United States.

INTERNATIONAL PHARMACISTS

Individuals who have received their pharmacy degrees from non-U.S. institutions have two options to become licensed pharmacists in the United States. They can complete the Foreign Pharmacists Equivalency Examination, which is given once a year by the National Association of Boards of Pharmacy. Passing this exam and completing other requirements allows international pharmacists to complete state licensure exams. For further information about this process, contact NABP at (708) 698-6227.

International pharmacists are also eligible to apply to the school's Pharm.D. program and then upon graduation from that program become eligible to complete state licensure exams. Credit may be given for equivalent coursework previously completed with a grade of "C" or better. Credit may be awarded after an evaluation of the course and an assessment of student knowledge by the coursemaster. Based on the structure of the curriculum, international pharmacists enter the first professional year of the four-year Pharm.D program. Admission is based on an evaluation of applicant credentials by the admissions committee.

International pharmacists are encouraged to take the PCAT exam to assess background knowledge.

LICENSURE REQUIREMENTS

Completion of the Pharm.D. degree satisfies the educational requirement for all state boards of pharmacy in the United States. Graduates are eligible to take state licensing exams in all states. Information for licensure as a pharmacist in Maryland is available from the Maryland Board of Pharmacy, 4201 Patterson Avenue, Baltimore, MD 21215-2299.



Financial Information

TUITION AND FEES

The following table lists the fees and expenses for the 1995-96 academic year. Some of the fees(*) do not apply to nontraditional pathway students. Nontraditional pathway students are charged per credit hour regardless of number of hours taken.

Tuition:		<u>Full-time</u>	<u>Part-Time</u>
Full Time (9 or more cr.)	Resident	\$ 5,591	
	Nonresident	11,585	
Part Time - Per Credit Hour	Resident		212
	Nonresident		382

Fees:

Student Government Association	15	8
Transportation	20	10
Student Activities	50	50
Supporting Facilities	199	68
Clinical Clerkship(for experiential courses)	300	300

Other Expenses:

Application Fee (nonrefundable)	40	40
Nonrefundable Deposit (upon Acceptance for Admission)	200	200
Late Registration Fee	40	40
Diploma Fee	40	40
Liability Insurance	17	17
Disability Insurance *	15	15
Hepatitis B vaccine * (1st Year only)	140	140
Continuing Education Certification (Nontrad only)	100	100
Late Payment of Tuition and Fees	100	100

The university reserves the right to make such changes in fees and other changes although every effort is made to keep the cost to the student as low as possible.

HEALTH INSURANCE

The university believes that it is important for all students to have health insurance. Thus, health insurance coverage is required of all full-time students. Students will be billed for health insurance unless they provide proof of similar coverage to the office of student and employee health. If documentation is provided, the cost of the premium is waived. The cost of UMAB health insurance varies depending on the type of coverage. For the 1995/96 academic year, the cost per semester for student

only coverage is \$400; student and spouse, \$960; student and child \$760; and student and family is \$1,200 per year.

DETERMINATION OF IN-STATE RESIDENCY

An initial determination of residency status for admission and tuition is made by the University of Maryland at Baltimore office of records and registration when a student's application for admission is under consideration. The determination made at that time, and any determination made thereafter, shall prevail for each semester until the status is changed. Students classified as in-state residents are responsible for notifying the University of Maryland at Baltimore office of records and registration in writing, within 15 days of any change in their circumstances which might in any way affect their classification at UMAB. Copies of the university's policy on in-state residency status are available from that office.

FINANCIAL AID

Student financial aid programs are centrally administered by the University of Maryland at Baltimore office of student financial aid. These programs are designed to help students who otherwise would be unable to attend the university. Aid packages for full-time students often include a combination of loans, grants, scholarships and work-study designed to meet the student's need. Most nontraditional pathway students do not qualify for financial aid due to their part-time status and relatively secure financial situation. To qualify for aid, students must apply annually and meet certain eligibility requirements. **Students are encouraged to complete their financial aid application by February 15th.** Students must complete the required Financial Aid application forms, which are available from:

Student Financial Aid
Baltimore Student Union
Room 334
621 West Lombard Street
Baltimore, MD 21201

SCHOOL OF PHARMACY SCHOLARSHIPS

Through the generous gifts of alumni, friends and professional associations, the school provides additional financial aid to its full-time students. Students do not apply for these awards. Most awards are given to those students who can document unmet financial need through UMAB's Student Financial Aid; others are given to students from a certain geographical area.

The following scholarships have been established:

Marilyn I. Arkin Scholarship Fund. The family and friends of Marilyn I. Arkin, daughter of Ann and Morris Arkin and a member of the class of 1975, estab-



Dr. David A. Knapp, Dean, School of Pharmacy

lished this scholarship as a memorial in 1988. The scholarship provides support for professional students in the School of Pharmacy.

H.J. (Jack) Custis Jr., Memorial Scholarship Fund. In memory of H.J. (Jack) Custis Jr., class of 1951, a fund has been established for the purpose of awarding scholarships on the basis of reasonable need and academic ability to students in the professional program on the Baltimore campus of the School of Pharmacy. Students must be residents of one of the nine Eastern Shore, Maryland counties to be eligible for the Custis Memorial Scholarship.

Isadore M. and Irene R. Fischer Memorial Scholarship Fund. The families of Isadore M. and Irene R. Fischer have provided a scholarship fund to support a professional or graduate student demonstrating academic excellence in the educational programs of the University of Maryland School of Pharmacy. While financial need can be a consideration, the scholarship award may be made solely on academic performance.

Charles L. Henry Memorial Scholarship. The Charles L. Henry Memorial Scholarship Fund has been provided for Pharm.D. students in the School of Pharmacy requiring financial assistance.

J. Gilbert Joseph Scholarship. In memory of her brother, J. Gilbert Joseph, a former student of the School of Pharmacy, the late Miss Jeanette Joseph provided a generous bequest to endow scholarships to be awarded to qualified students who have maintained a superior scholastic average and who are in need of financial assistance.

Frederick William Koenig Memorial Scholarship. In memory of her husband, Frederick William Koenig, a practicing pharmacist for 50 years, the late Mrs. Valeria R. Koenig has bequeathed a sum of money to endow a scholarship to be awarded annually. The recipient of the award will be selected on the basis of financial need, character and scholarship.

Dr. Dean E. Leavitt Memorial Scholarship Fund. In honor of Dr. Dean E. Leavitt, associate dean for administration and professional services, 1976-1989, the family and the faculty established a fund to support a scholarship covering the final

year of pharmacy school for students who have attained at least a cumulative average of 3.0, who have shown superior aptitude and enthusiasm in the course sequence in management, and who have demonstrated, as Dean Leavitt did, a commitment to the qualities of health and humanitarianism, both personally and professionally.

A.M. Lichtenstein Scholarship. In memory of her husband, A.M. Lichtenstein, distinguished alumnus of the School of Pharmacy class of 1889, the late Mrs. Francina Freese Lichtenstein bequeathed a sum of money to endow an annual scholarship to a resident of Allegheny County, Maryland. The recipient of the award is to be selected on the basis of financial need, character and scholarship.

Aaron and Rosalie Paulson Scholarship Fund. Mr. Aaron A. Paulson, class of 1924, and his late wife, Rosalie, provide the school with an annual gift to support a first professional year student with demonstrated financial need.

Plough Pharmacy Student Scholarships. The Plough Foundation, created by Abe Plough, founder of Plough Inc., and the School of Pharmacy contributed funds to an endowment which provides financial support to pharmacy students. The funds are awarded on the basis of financial need, academic achievement, leadership and citizenship.

Arthur Schwartz Memorial Scholarship Fund. The family and friends of Arthur Schwartz, BS Pharm 1979, Ph.D. Pharmacy Administration 1987, have established an endowed scholarship fund to honor his memory.

LOAN FUNDS

Rose Hendler Memorial Fund. L. Manuel Hendler and family have established a loan fund in memory of Mrs. Rose Hendler for needy students. Loans from this fund are available to qualified students of the second and third years and are made upon the recommendation of the dean.

Louis T. Sabatino Memorial Student Loan Fund. In honor and memory of her late brother, Louis T. Sabatino, class of 1939, Mrs. Marie Sabatino DeOms has established this fund to provide loans to deserving students.

Benjamin Schoenfeld Memorial Pharmacy Loan Fund. The family of Mr. Benjamin Schoenfeld has established a loan fund as a memorial to him. This fund is available to qualified needy students. Loans are made upon the recommendation of the dean.

STUDENT VETERANS

New students (including nontraditional pathway students) who are eligible for educational benefits through the Veterans Administration should forward a completed VA Form 22-1995 (Request for change of Program or Place of Training) to the office of student affairs. Veterans who have not used any of their VA educational benefits should forward a completed VA Form 22-1990 (Application for Program of Education or Training) and a copy of DD 214 (Separation Papers) directly to the office of student affairs of the School of Pharmacy.

Doctor of Pharmacy (Pharm.D.) Program

DESCRIPTION

The four year Pharm.D. program is divided into six levels: Fundamentals, Basic Science, Pharmaceutical Science, Integrated Sciences and Therapeutics, Experiential Learning and a Curriculum-Practice Interface. The following describes the academic purpose of each level.

LEVEL I: FUNDAMENTALS

Students entering the Doctor of Pharmacy program have diverse educational and life experiences. Level I includes courses to address these diversities by introducing students to the concept and scope of pharmaceutical care, pharmacy practice in general, informing them of the variety of disciplines that will contribute to their pharmaceutical education, and providing the skills and scientific principles and concepts fundamental to subsequent curricular experiences.

LEVEL II: BASIC SCIENCE

During Level II of the curriculum, students build on the fundamentals of Level I through a comprehensive examination of basic biological, chemical, physical, social and behavioral sciences. These elements provide the foundation for understanding pharmaceutical science and the complexities of drug action and use.

LEVEL III: PHARMACEUTICAL SCIENCE

The provider of pharmaceutical care must possess a detailed and comprehensive understanding of the physical, chemical, biological and psychosocial factors impacting on the outcomes of drug therapy in specific patients with specific diseases. Level III addresses pharmaceutical science content areas as they relate to the needs of patients in the total health care environment.

LEVEL IV: INTEGRATED SCIENCES AND THERAPEUTICS

This forum addresses the extensive interweaving of basic and clinical science as well as the interrelated bodies of knowledge associated with the disciplines involved in



Dr. Prashant Chikhale

total pharmaceutical care. Students build upon their basic and pharmaceutical science background as they actively participate in a variety of didactic and laboratory experiences to design, implement, manage and monitor individualized plans for pharmaceutical care. Students learn to appreciate that the successful outcomes of drug therapies relate to complex physical, chemical, biological and psychosocial interactions within human systems, and therefore require individualized attention to patients during the design and delivery of pharmaceutical care. This application of integrated science to patients with specific diseases is presented within the broader context of public health, epidemiology, prescriber education, disease prevention and health promotion issues.

Three progressive components are used to present each disease. The **first** component reviews the drugs and biologicals used to treat specific disease processes and emphasizes comparative features underlying the choice of agent (Pharmacodynamics and Pharmacokinetics). Chemical properties, such as solubility and stability, that impact on the choice and use of the products, are discussed (Biomedical Chemistry and Pharmaceutics). The availability and comparative advantages of drug dosage formulations and delivery systems are considered as they relate to the optimum use of drug products during acute or chronic care (Biopharmaceutics).

The **second** component illustrates how the links between the scientific knowledge of the disease, available drug products and the variables underlying a particular patient's condition are important to developing the most appropriate therapeutic plan. Methods for the choice of drug products, definition of specific goals of therapy including the means to assess whether these goals are being achieved, and active intervention steps to ensure successful outcomes of drug therapy are developed (Therapeutics). Methods for monitoring, identifying and responding to untoward consequences of drug therapy are identified (Toxicology and Adverse Drug Reactions). The choice and design of specific acute and chronic drug therapy, the impact of a variety of patient-related variables on dosage regimens, and the modification of dosage regimens in response to changing patient

needs, are developed (Clinical Pharmacokinetics). Students practice and develop skills in counseling patients about their therapeutic plans in particular, and providing health promotion education in general (Counseling and Education).

The **third** component links the knowledge base of the first two components with appropriate ongoing methods for drug use review, medical audits and cost considerations. The emphasis is on identifying specific interventions to improve prescribing patterns and reduce the cost of health care (Drug Use Evaluation).

LEVEL V: EXPERIENTIAL LEARNING

Experiential learning is a series of structured learning and training activities during which students work under the supervision of experienced preceptors (pharmacy practitioners who have faculty rank) and academic faculty in a variety of health care settings. Students obtain and apply knowledge and skills necessary for successful delivery of pharmaceutical care and develop competence, confidence and maturity as responsible professionals. An innovative feature of the program is that experiential learning activities occur throughout the curriculum and are linked to didactic courses. A total of 32 credits in experiential courses (approximately 1,600 clock hours) are required for the degree. All students must complete at least 24 credits (1,100 clock hours) of experience devoted to provision of pharmaceutical care directly to patients. *Successful completion of the experiential learning portion of the schools curriculum is accepted by the Maryland Board of Pharmacy as meeting the internship requirements to sit for the NABPLEX licensure examination.*

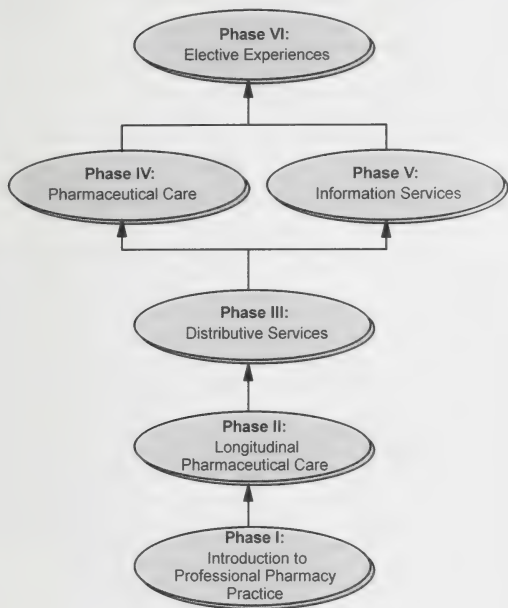
Experiential learning is organized into six phases.

Phase 1: Introduction to Professional Pharmacy Practice. This early practice experience introduces students to the professional responsibilities of pharmacists in a variety of practice environments, including community, hospital and specialty settings. Students will also examine the spectrum of career opportunities available to today's pharmacist and begin developing basic practice skills.

Phase 2: Longitudinal Pharmaceutical Care. During the second and third years of the curriculum, students observe and participate in the delivery of pharmaceutical care to patients. Students follow, over time, the changing needs of patients within the context of the total health care system. Through direct patient encounters and discussion sessions, students learn to assess health status, communicate effectively, and determine pharmaceutical care needs from a holistic perspective. These activities are linked to material students receive in the didactic curriculum and specifically apply patient assessment skills taught as part of the Human Biology (Anatomy, Physiology, Pathophysiology) sequence.

Phase 3: Distributive Services. Activities during this phase enable the student to competently and proficiently perform the technical functions of drug dispensing and distribution in institutional and community pharmacy settings. Students learn to receive, interpret, and verify the appropriateness of prescription orders. Students learn to efficiently dispense a variety of prefabricated and compounded medications, recognizing the role of technology and ancillary personnel in the drug distribution process.

Experiential Learning Map



Phase 4: Pharmaceutical Care. Students obtain experience in the delivery of pharmaceutical care in a variety of practice environments, including community-based and acute care hospital pharmacies and ambulatory primary care and interdisciplinary clinics. Through daily encounters with patients and other health care providers, students learn to collect patient-specific data, identify and assess drug-related problems, develop monitoring plans and measure outcomes of therapy. Further, students learn to educate patients and health care professions regarding the appropriate use of drugs.

Phase 5: Informational Services. Activities during this phase (which occurs simultaneously with Phase 4) require the student to provide drug information in the context of delivering pharmaceutical care. Students learn to receive a question in a comprehensive fashion, thoroughly analyze and research questions, and provide appropriate answers to other health care providers and to patients and their families.

Phase 6: Elective Experiences. Elective rotations allow students to pursue their own areas of interest. Electives in general practice environments enable students to develop greater skill, proficiency and confidence. Electives in specialty pharmacotherapeutic practice areas, alternative forms of advanced practice management, and research afford opportunities to explore a variety of practice options. This phase is linked to a senior colloquium.

Student performance during all six phases is evaluated by both preceptor and academic faculty. Experiential rotations are **not** permitted at a site where a student is working for pay or where any other conflict of interest situation may exist.

LEVEL VI: CURRICULUM - PRACTICE INTERFACE

The sixth and final level of the curriculum contains a variety of educational experiences for the students about to enter practice. Required and elective content areas provide a curricular-based interface with pharmacy practice that builds on the preceding didactic and experiential components of the curriculum. The “capstone” nature of this interface reflects the acquisition and appreciation of information that 1) is on the cutting edge of pharmacy practice, 2) represents closing options for individual curricular pathways or 3) contributes to preparing students for a post-graduate education.

It is expected that the learning at the interface will be under continual change and development. One goal of this level is to allow each senior student, following completion of his or her experiential components, time to consider his or her individual practice in the context of the total health care environment. An important part of this interface, therefore, will be the opportunity for students to reflect interactively upon their educational experiences with fellow students, faculty and practitioners.

CURRICULUM PATHWAYS AND ELECTIVES

The central curricular theme, primary pharmaceutical care, encompasses the educational experiences common to all students in the program. All students must successfully complete the required core curriculum which prepares them for competent performance of basic pharmaceutical care in a variety of professional and practice settings. To supplement the required core curriculum, more than 21 percent (28 credits) of the four year curriculum is reserved for didactic and experiential electives. This elective portion of the curriculum provides students with an opportunity for flexible programming of their educational experience. In collaboration with their academic advisors, students use electives to develop a personal plan of study that is consistent with their personal interests and career goals. These plans of study are used to enhance their general practice of pharmaceutical care, to focus on a particular area of practice or to prepare for post-graduate studies.

Students may select freely from elective options to design their personal plan of study, or may choose one of several model pathways which have been designed by faculty to enhance students' preparation for common areas of interest. The

model pathways generally account for 16 to 18 credits out of the 28 elective credits required for degree completion. Therefore, selection of a model pathway still provides considerable flexibility in selection of additional electives. Four model pathways have been developed by faculty:

Advanced Pharmacy Practice

Goal: To prepare students to implement pharmaceutical care in a variety of practice settings. This pathway provides a series of didactic and experiential courses designed to enhance competence in delivery of pharmaceutical care in general practice, enhance competence in delivery of health care to special populations (such as geriatrics), enhance skills and knowledge in special pharmaceutical products, enhance business and managerial skills needed to successfully implement new services, and to give students experience in applying these professional practice, business and managerial skills in a variety of advanced practice settings.

Pharmacotherapy

Goal: To enhance the ability of students to independently optimize, implement and monitor drug therapy in patients with complex health care problems. This pathway offers a series of didactic seminar courses in pharmacotherapy and advanced therapeutics coupled with advanced clinical experiences. The clinical experiences involve direct drug therapy management of patients in general medical and sub-specialty environments. Students completing this pathway are encouraged to pursue post-Pharm.D. training in the form of residencies and fellowships and to eventually pursue specialty board certification in pharmacotherapy.

Management

Goal: To provide students with management skills and knowledge to enhance their opportunities to enter management career pathways in corporate pharmacy, to develop entrepreneurial capabilities, and prepare them for acceptance into post-Pharm.D. management residencies and/or MBA programs. Students take a series of didactic and experiential courses in personal management, practice management, organizational behavior, financial reporting and analysis, marketing and experiences working with managers in health care settings.

Research

Goal: To expose students to research and better prepare them for graduate studies or post-graduate fellowships. Students selecting this pathway take courses in advanced educational opportunities, advanced seminar courses in selected scientific areas, research experiences working directly with faculty scientists, and a senior colloquium.

Faculty pathway coordinators, who design and maintain the integrity of the pathways, and faculty advisors who have expertise in each pathway area, serve as consultants to students for information on career opportunities resulting from particular pathways. Students have freedom of choice in selecting a pathway. Students not choosing to take all courses in a specific pathway, can select elective courses from multiple pathways as part of their personal "plan of study" provided they complete appropriate prerequisites.

Summary of Pharm.D. Program

COURSEWORK	MINIMUM SEMESTER CREDITS
Didactic	100 credits
80 Required	
20 Elective	
Experiential	32 credits
24 Required	
8 Elective	
Total	132 credits

COURSE WORK BY SEMESTER¹

SEMESTER ONE	CREDITS
PHAR 511: Biochemistry I	2
PHAR 512: Cell Biology	2
PHAR 513: Drug Chemistry	2
PHAR 514: Human Biology I	3
PHAR 515: Personal Management	1
PHAR 516: Pharmacy Practice & Education	3
PHAR 517: Study Design and Analysis	2
TOTAL	15
SEMESTER TWO	
PHAR 521: Biochemistry II	3
PHAR 522: Context of Health Care	3
PHAR 523: Ethics in Pharmacy Practice	1
PHAR 524: Human Biology II	3
PHAR 525: Immunology	2
PHAR 526: Physical Chemistry	2
PHPC 527: Intro. to Professional Practice	1
DIDACTIC ELECTIVES	2
TOTAL	17

¹This outline is one suggested plan of study for electives. Electives can be taken during most fall, winter, spring and summer semesters.

SEMESTER THREE

PHAR 531: Pharmaceutical Chemistry	2
PHAR 533: Microbiology I	2
PHAR 534: Human Biology III	3
PHAR 536: Pharmacology I	2
PHAR 537: Principles of Drug Action	2
PHAR 541: Biopharm and Pharmacokinetics	3
PHPC 532: Longitudinal Pharmaceutical Care I	1
DIDACTIC ELECTIVES	2
TOTAL	17

SEMESTER FOUR

PHAR 542: Clinical Chemistry	1
PHAR 543: Microbiology II	2
PHAR 544: Medicinal Chemistry	3
PHAR 545: Practice Management	3
PHAR 546: Pharmacology II	3
PHAR 535: Pharmaceutics	3
DIDACTIC ELECTIVES	2
TOTAL	17



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SEMESTER FIVE

PHAR 550: Medical Information Analysis	1
PHAR 551: Drug Use Review	1
PHAR 552: Principles of Human Nutrition	1
PHAR 554: Integrated Science/Therapeutics I	4
PHAR 555: Integrated Science/Therapeutics II	4
DIDACTIC ELECTIVES	4
TOTAL	15

SEMESTER SIX

PHAR 564: Integrated Science/Therapeutics III	4
PHAR 565: Integrated Science/Therapeutics IV	4
PHPC 562: Longitudinal Pharmaceutical Care II	1
DIDACTIC ELECTIVES	6
TOTAL	15

SEMESTER SEVEN

PHPC 570: Community Distributive Services ²	3
PHPC 571: Institutional Distributive Services ²	3
PHPC 572: Pharmaceutical Care I ¹	3
PHPC 573: Pharmaceutical Care II ²	3
PHPC 574: Pharmaceutical Care III ²	3
PHPC 575: Pharmaceutical Care IV ²	3
PHPC 576: Ambulatory Clinic ¹	1
PHPC 577: Informational Services ¹	2
TOTAL	21

SEMESTER EIGHT

PHAR 580: Pharmacy Law	2
PHAR 581: Senior Colloquium	1
EXPERIENTIAL ELECTIVES ²	8
DIDACTIC ELECTIVE COURSES	4
TOTAL	15

GRAND TOTAL**132 minimum credits**

¹Taken concurrently with Pharmaceutical Care Rotations

²Students complete experiential rotations at various times during year, but register for the rotations in the semesters listed.

COURSE DESCRIPTIONS

FIRST YEAR COURSE DESCRIPTIONS

PHAR 511—Biochemistry I (2)—Fall Semester (Reynolds)

PHAR 521—Biochemistry II (3)—Spring Semester (Reynolds)

A course of study which builds on the principles of cell biology and genetics with a systematic consideration of the chemical components and requirements of living systems from the molecular to the cellular level. These fundamentals of biochemical structure, function and energetics provide a platform for comprehension of pharmaceutical biotechnology, and for understanding determinants of disease, the pathobiochemistry of organ systems, mechanisms of drug action and adverse reactions and novel drug delivery systems.

PHAR 512—Cell Biology (2)—Fall Semester (Digate)

Introductory appreciation of the cell, the fundamental unit of the body. The integration of cell structure and molecular functions is developed with discussions of topics such as the history of modern biology; the basic principles of cellular cytoarchitecture and organization; membrane functions; biochemical structure, functions and energy conversion; cell-to-cell signaling; the flow of genetic information from DNA to RNA to proteins; cell division; human and Mendelian genetics; and human diversity.

PHAR 513—Drug Chemistry (2)—Fall Semester (Callery)

A study of the principles of organic chemistry that comprise basic elements of pharmaceutical science. The emphasis is on the relationship between molecular structure and chemical, physical and biophysical properties of systems that arise from molecular interactions. The course provides a platform for comprehension of pharmaceutical concerns such as the stability of drugs and drug products, the conformation of bioactive proteins, the basis for drug-receptor interactions, the structure of biological membranes, and major drug classes.

PHAR 514—Human Biology I (3)—Fall Semester (Eccles)

PHAR 524—Human Biology II (3)—Spring Semester (Buterbaugh)

PHAR 534—Human Biology III (3)—Fall Semester, Second Year (Kerr)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems.



PHAR 515—Personal Management (1)—Fall Semester (Kinnard)

An introduction to the basic elements of social and administrative science underlying the practice of pharmacy. The student is introduced to state and federal laws including those related to negligence, standards of practice, and dispensing. Organizational theories of management and leadership styles are contrasted.

**PHAR 516—Pharmacy Practice and Education (3)—
Fall Semester** (Zuckerman)

This prefatory course introduces the new Doctor of Pharmacy student to the science and profession of pharmacy. The evolution and implications of pharmaceutical care and the philosophical basis for the pharmacy curriculum are discussed. Students are introduced to skills necessary for success during the four year curriculum through the opportunity to critically evaluate problems, discuss ethical dilemmas, develop and apply computer and literature retrieval skills, and practice verbal and written communication skills. The importance of independent and cooperative learning activities is emphasized.

PHAR 517—Study Design and Analysis (2)—Fall Semester (Dukes)

Students are introduced to the pivotal role of study design and statistical analysis considerations in the design and evaluation of basic, clinical, epidemiological and social science research. The course focuses on the proper design of studies with emphasis on threats to internal validity and generalizability. A variety of descriptive and inferential statistical procedures and methods are surveyed with emphasis on the interpretation of the results of research.

PHAR 522—Context of Health Care (3)—Spring Semester (Palumbo)

Students actively develop a contemporary definition of health care and critically examine the health care system with special emphasis on relevant legislation, traditional and nontraditional providers of health care, the organization and financing of health care delivery, and the dynamics of pharmaceutical care within the system. The social, legal and professional implications of informatics and computer proliferation in our society is discussed with special emphasis on pharmacy practice.

PHAR 523—Ethics In Pharmacy Practice (1)—Spring Semester (Love)

Introduction to the principles of ethical thinking. The philosophy of ethics and role of formal codes of professional conduct are discussed in the context of resolving conflicting ethical principals.

PHAR 525—Immunology (2)—Spring Semester (Hayashi)

The natural and acquired protective mechanisms of the immune system are discussed with topics ranging from the structure, function and specificity of antibodies; B-lymphocyte and T-lymphocyte functions; initiation and control of immune responses; histocompatibility; and immune-mediated disease. The course is designed to provide the student with sufficient knowledge of humoral and cellular immunity to understand the role of the immune system in disease, the production and use of vaccines and related biologicals, and the rapidly growing areas of transfusion, transplant and tumor immunology.

PHAR 526—Physical Chemistry (2)—Spring Semester (Guiles)

A study of selected principles of physical chemistry that comprise basic elements of pharmaceutical science. The emphasis is placed on the relationship between molecular structure and the physical and biophysical properties of systems that arise from molecular interactions. The goal of the course is to apply the principles of physical chemistry to the practice of pharmacy.

PHPC 527-Introduction to Professional Practice (1)—

Fall/Spring Semesters (Oed) [Register during Spring Semester-1st Year]

Students observe the practice of pharmacy in community, institutional, and specialty practice environments. Student analyze the types of services provided in each setting and the personnel involved in the delivery of those services. Students learn the basic elements of pharmaceutical care, including obtaining patient histories and prescription dispensing. An important goal of this course is for students to identify and assess career options in pharmacy practice. These activities are closely linked to PHAR 516: Pharmacy Practice and Education and to a career pathway workshop.

SECOND YEAR COURSE DESCRIPTIONS**PHPC 532—Longitudinal Pharmaceutical Care I (1)—Fall/Spring**

Semesters (Rodriguez deBittner) [Register during Spring Semester-2nd Year]

Students observe the delivery of pharmaceutical care to patients over time. Particular attention is paid to assessing the changing needs of patients as health transitions occur. Under the supervision of an experienced pharmacy practitioner, students have regularly scheduled encounters with patients. Students learn how to effectively collect information from a variety of sources, including the patient, and prepare periodic health status reports. As students obtain knowledge and skills in didactic courses (pharmaceutics, pharmacology, human biology), they learn to explicitly apply such knowledge and skills to their patients.

PHAR 533—Microbiology I (2)—Fall Semester (Blomster)

PHAR 543—Microbiology II (2)—Spring Semester (Blomster)

A systematic study of microbial morphology, biochemistry and physiology. Major classes of pathogenic bacteria, viruses, fungi and parasites are surveyed with emphasis on mechanisms of pathogenicity, virulence and resistance. Microbial genetics is discussed, including the role of this area in the development of modern molecular biology and biotechnology. The course prepares the student for study of the etiology and consequences of infectious disease, and the use of antibiotics and other biologicals for their treatment.

PHAR 531—Pharmaceutical Chemistry (2)—Fall Semester

(MacKerell)

A presentation of the basic chemical principles underlying the activity, absorption, metabolism, excretion, physico-chemical properties and design of drug molecules, culminating in a discussion of drug classes.

PHAR 535—Pharmaceutics (3)—Spring Semester (Augsburger)

The application of fundamental principles and basic science knowledge to the multidimensional problems of the formulation, development, testing, production, distribution and administration of safe, effective, stable and reliable drug delivery systems. These systems, ranging in sophistication from tablets and capsules to biodegradable implants, are discussed using a problem-based approach that focuses on the critical determinants for traditional and less-traditional routes of drug administration.

PHAR 536—Pharmacology I (2)—Fall Semester (Weiner)

PHAR 546—Pharmacology II (3)—Spring Semester (Weiner)

A systematic consideration of the molecular, cellular and organismic mechanisms of drug action, organized by major drug classes. This course of study provides knowledge of the mechanisms of drug action underlying their use in the treatment of specific and general disease processes.

PHAR 537—Principles of Drug Action (2)—Fall Semester

(Moreton/Hickey)

A study of the chemical and biological concepts which apply to the characterization, evaluation and comparison of all drugs. Topics such as dose-response and receptor theory, receptor transduction mechanisms, pharmacologic selectivity, pharmacogenetic drug tolerance and dependence, drug allergy, drug resistance and chemical mutagenesis, carcinogenesis and teratogenesis are discussed at the molecular and cellular level. The physical, biological and chemical principles underlying drug absorption, distribution, biotransformation and excretion are discussed from the molecular to the organ level.

**PHAR 541—Biopharmaceutics and Pharmacokinetics (3)—
Fall Semester** (Eddington)

In this course, the student learns how the processes of drug absorption, distribution, metabolism and excretion are coupled with dosage and the important para-

meters of clearance, volume of distribution and bioavailability, to determine the concentration of a drug at its sites of action in the body. The quantitative relationship between dose and effect is developed as a framework with which to interpret measurements of drug concentrations in biological fluids.

PHAR 542—Clinical Chemistry (1)—Spring Semester

(Undie/Michocki)

Principles of analytical chemistry, clinical chemistry, enzyme assays, electrophoresis, radioactivity, magnetic resonance, biotechnology-based diagnostics and biosensors, and immunoassay are examined. Emphasis is on the application of these methods to the determination of drug concentrations in chemical and biological systems, and health promotion and assessment. Students also have opportunities to examine patient data and use commercially available diagnostic kits.

PHAR 544—Medicinal Chemistry (3)—Fall/Spring Semesters

(Wright) [Register during spring semester]

A comprehensive study of the chemistry of drug products. The course outline will follow the pharmacological classification of drug molecules, and will include discussion of chemical properties (physical and organic), stability, solubility, mechanisms of action where appropriate, and structure-activity relationships. Where possible, quantitative computer designed studies of drug development will be mentioned.

PHAR 545—Practice Management (3)—Spring Semester (Abramson)

Management principles are provided to construct a practical framework for the operational management of a business of pharmacy. Elements addressed in this course include: controllable and uncontrollable variables in a free market economy, work flow analysis, accounting, budget development, purchasing, inventory control, quality assurance and third party reimbursement issues. The course also examines the current practical developments related to human resources management through integrating information on organization behavior, psychology, economics and law.

THIRD YEAR COURSE DESCRIPTIONS

PHAR 550—Medical Information Analysis (1)—Fall Semester (Mays)

A course designed to familiarize students with the process of information collection, retrieval, analysis and interpretation. A variety of topics surrounding drug information are covered including the drug approval process, role of drug information in the health care system, the biomedical publishing process, adverse drug reaction management, quality assurance and formulary management. The course also further develops and refines verbal and written communication skills through a variety of exercises.



Dr. Magaly Rodriguez deBittner

PHAR 551—Drug Use Review (1)—Fall Semester (Rodriguez deBittner)

An examination of the review of physician prescribing, pharmacist dispensing and patient use of drugs. A framework for this course is centered around the five steps of drug use review which include: determining optimal drug use through the process of criteria development; measuring or observing how drugs are actually used; comparing actual with optimal use and noting any differences; developing and implementing methods for effecting any change that is needed; and monitoring the results of the program.

PHAR 552—Principles of Human Nutrition (1)—Fall Semester, (Rosen)

This required course builds on materials in earlier coursework including Fundamentals, Basic Science and Pharmaceutical Science. The course focuses on the preparation of pharmacists to deliver pharmaceutical care services related to patients' nutritional needs. The course prepares the student to understand principles of nutrition in relation to contemporary public health issues and to treatment of diseases and physiologic processes. The materials taught in this course are applied and further developed in subsequent modules in the Integrated Science and Therapeutics course sequence and in Longitudinal Care II.

PHAR 554, 555—Integrated Science and Therapeutics (4,4)—Fall Semester (Dalby/Plaisance)

PHAR 564, 565—Integrated Science and Therapeutics (4,4)—Spring Semester (Love/Buterbaugh)

Basic and clinical science faculty interact with students during a variety of didactic and laboratory experiences as students learn to design, implement and monitor pharmaceutical care plans for specific patients with specific diseases. Methods for the choice of drug product, definition of the specific goals of therapy, including the means to assess whether these goals are being achieved, and active intervention steps at the patient, prescriber, health care system and population levels to ensure suc-

successful outcomes of drug therapy are developed. The courses are organized according to the major physiological systems of the human body, and the disease states commonly associated with them and encountered and observed by the pharmacy practitioner in a variety of community and institutional practice settings. A goal of these courses is to prepare our graduates to be better able to integrate new scientific knowledge into the successful pharmaceutical care of patients and the reduction of the cost of health care to patients and society. The knowledge and behaviors acquired during these courses prepare the student for the community and institutional pharmaceutical care rotations of the experiential learning program of the curriculum.

PHPC 562—Longitudinal Pharmaceutical Care II (I)—Fall/Spring Semesters (Rodriguez deBittner) [Register during Spring Semester-Third Year]

This course is a continuation of PHAR 532: Longitudinal Care I. Students have periodic encounters with previously assigned patients. Students learn to assess drug therapy problems and develop pharmaceutical care plans. Particular attention is given to the needs of patients during health transitions. These experiential activities are closely linked throughout the third year to the didactic activities in the Integrated Science and Therapeutics series of courses.

FOURTH YEAR COURSE DESCRIPTIONS

PHPC 570—Community Distributive Services (3)

PHPC 571—Institutional Distributive Services (3).

(Register during Fall Semester- Fourth Year)

These required professional practice experiences may be taken anytime after the successful completion of the second year. These rotations may be completed during the summer following the second year, during the winter session of the third



Dr. Gail Rosen

year, or during the summer following the third year. Each rotation is a four-week, full-time structured program of intensive skills development related to the distributive aspects of community and institutional pharmacy. Students will learn to competently and efficiently perform the technical functions of drug dispensing. Students learn to effectively use technology as a tool in drug distribution. The roles of support personnel and methods of supervision are explored. Mechanisms for assuring the quality and accuracy of the drug distribution process are emphasized.

PHPC 572—Pharmaceutical Care I (3)

PHPC 573—Pharmaceutical Care II (3)

PHPC 574—Pharmaceutical Care III (3)

PHPC 575—Pharmaceutical Care IV (3)

(Register during Fall Semester-Fourth Year)

Prerequisites: PHPC 570-Community Distributive Services, PHPC 571-Institutional Distributive Services, and successful completion of the Integrated Science and Therapeutics course series. This series of required professional practice experiences is designed for the student to obtain extensive experience in the delivery of pharmaceutical care in a variety of direct patient care settings. Students gain skill through daily one-on-one interactions with patients, care givers, physicians, nurses and other health care professionals. Each four week rotation is completed on a full-time basis. Of these four rotations, at least one must be completed in an acute care hospital setting and one in a community setting. Although each site will differ in terms of the patient population, disease acuity, scope of practice, resources and availability of patient-specific data, students will take responsibility for drug therapy outcomes. Students will learn to: 1) collect and record patient specific data, 2) identify, list and assess drug-related problems, 3) develop and record pharmaceutical care plans, 4) educate patients and health care professionals regarding the appropriate use of drugs, and 5) measure and document patient outcomes. These activities are closely linked to PHPC 576-Ambulatory Clinic and concurrent with PHPC 577-Informational Services.

PHPC 576—Ambulatory Clinic (1) (Register during Fall Semester-Fourth Year)

Prerequisites: PHPC 570-Community Distributive Services, PHPC 571-Institutional Distributive Services, and successful completion of the Integrated Science and Therapeutics course series. This series of required experiences are normally taken concurrently with the Pharmaceutical Care rotations (PHPC 572, 573, 574, and 575). A total of 16 half-day experiences are required for a total of 64 clock hours. Following the pharmaceutical care model, students will conduct patient interviews, perform appropriate pharmacotherapy-oriented physical assessments, order appropriate laboratory tests, initiate and/or change drug therapy regimens and conduct patient follow-up.

PHPC 577—Informational Services (2) (Register during Fall Semester-Fourth Year)

Prerequisite: Successful completion of PHAR 550-Medical Information Analysis. This course must be taken concurrently with the Pharmaceutical Care rotations



Dr. Gary Hollenbeck assists David London

(PHPC 572, 573, 574, and 575). During the course of daily activities on Pharmaceutical Care and Ambulatory Clinic rotations, students learn how to receive drug information questions in a comprehensive manner, conduct timely and thorough literature searches, evaluate sources of information and provide appropriate responses. Students are also expected to subscribe to an affordable abstracting service and develop a personal information library.

PHAR 580—Pharmacy Law (2)—Spring Semester (Palumbo)

An examination of the legal and regulatory issues pertaining to drugs and devices and the practice of pharmacy. Students learn the various laws and regulations which would govern their usual daily activities in a variety of practice sites.

PHAR 581—Senior Colloquium (1)—Spring Semester (Digate)

Students deliver oral presentations to share some aspect of their educational experience, practice aspirations or career goals with their student peers and the faculty. This forum facilitates discussions fostering a critical examination of each student's formal education in the context of the practice of pharmaceutical care.

ELECTIVE COURSES

The elective didactic (PHMY) and experiential (PHEX) courses currently offered by the School of Pharmacy are described below. In general, higher course numbers indicate courses with important prerequisite requirements, and are designed for later years of the curriculum. Prerequisites for most electives include consent of the instructor and the student's advisor. Some electives are offered in either the fall or spring semesters and some are offered both semesters. Refer to the class schedule when making course selections.

PHMY 510—Advanced Educational Opportunities (1) (Callery)

This elective program provides students who may be interested in graduate school or research careers with knowledge and information about various advanced educational opportunities in the curriculum. Aspects of careers which require advanced study are described by individuals in those career areas, and by students currently enrolled in them. Students enrolled in this course receive diverse perspectives relating to goals, training, functions, settings and opportunities in research in the pharmaceutical sciences and pharmacy practice areas.

PHMY 518—Drug Abuse Education (1-3) (Tommasello)

Practice and training in the dissemination of drug information, especially drug abuse information to the public, are linked to the activities of the Student Committee on Drug Abuse Education (SCODAE). Students complete a 10-hour training session, observe community education programs presented by SCODAE, present several programs and prepare a written report on a timely topic in the area of chemical dependence.

PHMY 521—History of Pharmacy (1)

A course which explores the historical development of pharmacy practice and medicines.

PHMY 522—Business Plan Development (2) (Oed)

An elective course for students interested in ownership or management of their own pharmacy practice emphasizing the practical problems associated with establishing a new business or expanding an existing enterprise. Location and market analysis, target marketing, revenue and expense projections and estimation of capital requirements are among the topics covered.

PHMY 523—Advanced First Aid (3) (Melton)

Advanced first aid and emergency care including CPR.

PHMY 524—Computers and their Applications to Pharmacy (2)

An advanced course in using computer software. Students complete a series of computer-based projects that illustrate how software can enhance various aspects of pharmacy practice.

PHMY 528—Selected Topics in Geriatrics and Gerontology (1-3) (Feinberg)

This course provides an educational experience through investigating areas of geriatrics and gerontology with the school's Center for the Study of Pharmacy and Therapeutics for the Elderly. Includes elder-visitation, during which students select an elderly person living in the community and track their pharmaceutical care needs. Guided discussions in school address problems/solutions to elder health care.

PHMY 529—Special Group Studies (var. 1-5). Repeatable up to 12 credits.

An omnibus course permitting experimentation with new or different subject matter and/or instructional approaches.

PHMY 537—Clinical Aspects of Drug Dependence (2) (Tommasello)

This course familiarizes students with the clinical aspects of chemical dependence. Special emphasis is placed on the pharmacology of commonly abused psychoactive substances and the role of pharmacological supports in the treatment of addiction.

PHMY 539—Special Projects (var. 1-3). Repeatable up to 12 credits.

Independent investigations consisting of library or laboratory research, seminars or other assignments appropriate to the problem investigated.

PHMY 541—Introduction to the Poison Center (1) (Anderson)

The Maryland Poison Center, a division of the School of Pharmacy, provides emergency poison information 24 hours a day to the general public and health professionals. Pharmacists play an extremely important role in the Poison Center's operation. The center serves an educational function for students at UMAB. This course provides students the opportunity to observe and be involved in a clinically oriented pharmacy practice setting early in their education. Students learn about the Poison Center's operation and resources and the potential for pharmacist participation in this area of patient care. The course consists of discussion sessions, activities in the Maryland Poison Center, role playing, and laboratories on toxicology resources and communication skills. Students present a home management and a hospital management drug overdose case.

PHMY 542—Cosmetics Preparations (2) (Augsburger)

This course is designed to stimulate student thought in the field of cosmetic science and technology. Upon completion of the course, the student will be able to discern among the various health benefit claims made by cosmetic preparations, and help consumers select appropriate products. Historical perspectives, as well as modern concepts of cosmetic formulation, composition, manufacture, promotion, and utilization are presented. During laboratory sessions, ingredient functionality and manufacturing processes are discussed, and students prepare representative cosmetic formulations.

PHMY 543—Honors Seminar in Pharmacy Administration (1)

(S. Speedie)

A survey of current literature in the general area of pharmacy practice and administrative science. Each week, a recently published paper related to the economic, social, behavioral or education aspects of pharmacy is discussed and evaluated. Special student research projects may also be undertaken.

PHMY 550—Adverse Drug Reactions (2) (Michocki)

Focus is on the clinical manifestations and incidence of drug reactions, systems affected, differentiation among idiosyncratic reactions, hypersensitivity reactions, extensions of pharmacologic action and assessment of drug reaction literature.

PHMY 551—Recent Advances in Pharmacology (1) (Kim)

The objective of this course is to present advances in pharmacology and toxicology. Sessions emphasize experimental and clinical findings, their interpretation and sig-

nificance in relation to basic and applied aspects of pharmacology and toxicology. Attention is also given to experimental design and methodology of the studies in question.

PHMY 552—Pharmacology and Aging (1) (Weiner)

This course presents advances in our understanding of variations in drug response in the aging population. The course is designed to give students an appreciation for the basic physiological and biomedical changes which normally occur with aging, and how these changes relate to altered pharmacodynamic and pharmacokinetic responses following drug administration. Basic and clinical pharmacologic studies are used to support the conclusions presented.

PHMY 553—Consumer Education Program for Older Adults (2) (Nagle)

The urgent need for pharmacists to become more involved with the health care of the elderly is well documented. This course trains students to educate the elderly about drugs and drug taking. Students benefit from the didactic and applied aspects of the course, since they must first learn about the special needs of the elderly and then actually interact with the elderly both in large groups and on a one-on-one basis.

PHMY 554—Health Education Seminar (2) (Fedder)

Health education is the scientific process designed to promote the health of individuals and groups using educational strategies to achieve voluntary behavioral change. The objective of the course is to prepare students to become effective health educators to patients, other health practitioners and/or the community. The theoretical and conceptual frameworks upon which the discipline is based are fully developed. Students learn the techniques of behavioral and educational diagnosis and their application in the development of educational intervention.

PHMY 555—Novel Drug Delivery (2) (Hollenbeck)

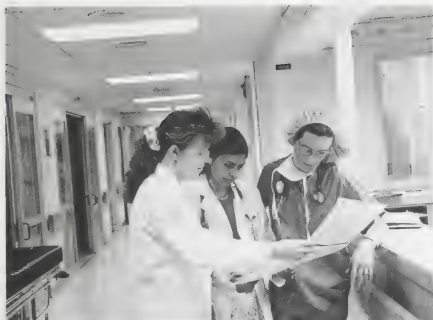
A study of specialized formulations, dosage forms and drug delivery systems. The goal of the course is to enable students to make decisions about the appropriate use of novel drug delivery systems from an integrated science and practice perspective, basing the decisions on the physical, chemical, therapeutic and economic attributes of these systems.

PHMY 556, 557—Advanced Pharmacology (2,2) (Moreton/Kim)

This course expands and extends the pharmacology material learned in the required courses PHAR 536 and 546. Discussion of the assigned topics and review of original papers represent a two-hour weekly session. These sessions include graduate students in Pharmaceutical Sciences/Pharmacology and Toxicology.

PHMY 560—The Pharmacist in the Critical Care Setting (1) (Hassan)

Identifies and discusses the role of the pharmacist in various critical care settings. The student will be able to see how critical care pharmacy has evolved to complement the medical and nursing management of the critically ill patient.



PHMY 561—Advanced Therapeutics Seminar (3) (Roffman)

An advanced course dealing with complex drug therapy decision-making utilizing case presentations and current literature. Requires active student participation in resolution of therapeutic controversies.

PHMY 562—Clinical Pharmacokinetics (2) (Reiss)

Provides the student with the didactic training and skills necessary to conduct clinical pharmacokinetic consultation.

PHMY 563—Pharmacotherapeutic Issues in the Critically Ill Patient (2)

This course is designed as an elective seminar for students interested in the area of critical care pharmacotherapy. Topics include a wide scope of disease states and drug issues frequently encountered in an ICU setting. The presentation of these topics will identify the pharmacologic aims and controversies in the management of a particular topic, while simultaneously underscoring the complexities of drug therapy in the critically ill patient, which may lead to untoward reactions or sub-optimal care.

PHMY 564, 565—Institutional Pharmacy I and II (2, 2)

Fundamentals of institutional pharmacy practice and administration with emphasis on hospital and nursing homes. Includes physical facilities, standards, purchasing, formulary implementation, record keeping, drug distribution and control systems.

PHMY 566—Orthotics Seminar (1) (Fedder)

This course introduces students to the management of patients with orthopedic problems and prepares them with entry level skills to counsel and fit orthopedic appliances (orthoses). Fitting and educational techniques are demonstrated and students are trained in fitting a range of both rigid and flexible orthoses.

PHMY 567—Advanced Cardiac Life Support (2) (Roffman)

This course focuses on the role of the pharmacist in the setting of cardiac arrest. A lecture format covers the pathophysiology, epidemiology, therapeutic goals and treatment modalities in cardiac arrest as described by the Standards and Guidelines developed by the National Conference on Cardiopulmonary Resuscitation and Emergency Cardiac Care. Topics include the role of the pharmacist on the cardiac arrest team, an in-depth discussion of the role of pharmacologic intervention, techniques of basic and advanced cardiac life support and post-resuscitative care.

PHMY 570—Current Topics in Infectious Disease (1) (M. Speedie/Plaisance)

This course is intended to provide a forum for discussion of current and controversial aspects of infectious disease therapy. Each student selects a new or controversial area of infectious disease therapeutics and prepares a one-hour lecture/discussion of that topic. Each student is expected to read selected background material and contribute to the discussion of the topic. Audiovisual aids and/or handouts are encouraged.

PHMY 571—Parenteral Therapy (2)

A comprehensive review of all aspects of parenteral therapy including planning, organizing and implementing an IV admixture program, preparation of sterile products, basic concepts of fluid balance and dosage state, blood products, parenteral nutrition, and chemotherapy and biotechnology products.

PHMY 580—Drugs and Public Policy (2) (Palumbo)

An examination of public policy issues related to drug use in our society. Cases, small group discussions and outside experts will be used to analyze contemporary issues effecting pharmacy and health care.

PHEX 550—Parenteral Nutrition (3)

A clinical experience designed to provide students with knowledge and experience in the design and monitoring of parenteral nutrition therapy.

PHEX 551—Drug Information Clerkship (2)

A clerkship designed to familiarize students with resources, develop their ability to search primary, secondary and tertiary sources, retrieve, analyze and interpret the medical literature, and to refine written and verbal communication skills.

PHEX 552—Poison Information (3)

A clerkship in the Maryland Poison Center providing students experience in providing poison information and consultation in clinical toxicology.

PHEX 560—Inpatient Medicine (3)

An experiential rotation designed to provide students with extensive experience in dealing with the drug therapy problems of hospitalized patients in general medical areas.

PHEX 561—Ambulatory Care (1-3)

This experiential rotation supplements PHPC 576: Ambulatory Clinic of the required curriculum. Students gain additional experience working in an interdisciplinary ambulatory health care delivery system with practicing clinical pharmacists and participating in the evaluation, implementation and monitoring of ambulatory clinic drug therapy.

PHEX 562—Clinical Pharmacokinetics Clerkship (3)

An experiential rotation providing education and training on adaptive control of drug therapy by integration of pharmacokinetics, pharmacodynamics, pathophysiology and patient data.

PHEX 563—586 (2 credits each)

Elective experiences in pharmacy subspecialty areas approved and designed by a site preceptor and the student's advisor.

PHEX 563—Administration

PHEX 564—Cardiology

PHEX 565—Critical Care/Shock Trauma

PHEX 566—Critical Care/MICU

PHEX 567—Diabetes Care Management

PHEX 570—Food and Drug Administration

PHEX 571—Gastrointestinal Surgery

PHEX 572—Geriatric Pharmacy Services

PHEX 573—Home Health Care

PHEX 574—Infectious Disease

PHEX 575—Infectious Disease/HIV

PHEX 576—Oncology

PHEX 577—Oncology/Infectious Disease

PHEX 580—Oncology/TPN

PHEX 581—Oncology/Research



Dr. Madeline Feinberg counsels a patient about her medications

PHEX 582—Pediatrics

PHEX 583—Radiopharmacy

PHEX 584—Chemical Dependence Treatment

PHEX 585—Chemical Dependence Research

PHEX 586—Veterinary Medicine

PHEX 589—Special Studies (2-3). Repeatable up to 12.

Omnibus course permitting development with new experiential electives or additional subspecialty practice area elective rotations.

Nontraditional Pathway

DESCRIPTION

The nontraditional Pharm.D. pathway is a mechanism for licensed B.S. pharmacists to earn the Doctor of Pharmacy degree. All graduates will be required to meet the **terminal performance outcomes** of the school's Pharm.D. program. Satisfying these terminal objectives takes at least 30 credits of coursework. Since each non-traditional student brings to the program a different level of practical experience, knowledge and skill developed throughout a practice career, a system of Prior Learning Assessment (PLA) has been developed to individualize a program of study and award credit(s) (0-10) when appropriate.

A faculty mentor will work with each student to design a program based on input from prior learning assessment. It should be noted that the awarding of credit through assessment of prior learning does not exempt a participant from responsibility for any of the process or knowledge-based outcomes of the program. Experiential learning will be centered in the pharmacist's own practice site, under the supervision of a faculty mentor, and utilizing the pharmacist's own patients. Some clerkship experience is required at other sites. The mentor will also work closely with each pharmacist to identify an appropriate mix of patients and to develop an appropriate experience component that will meet individual and pathway needs.

Credits in the nontraditional Pharm.D. pathway may be earned by taking courses from a menu approved by the faculty, through supervised experiential learning, by approved self-study with appropriate assessment and/or through PLA. The foundation of the nontraditional Pharm.D. pathway is established in the core courses: i.e., the philosophy of the program is developed; the concepts, procedures and skills of pharmaceutical care delivery are defined and demonstrated; and a personal documentation of prior learning is developed.

Required courses in the pathway include an in-depth treatment of therapeutics for prevalent diseases specific to the practice site, so that the pharmacists are prepared to provide pharmaceutical care services. Candidates will demonstrate the ability to manage a practice fiscally and behaviorally; to measure value of service(s) and establish fees and reimbursement policies; and to market and promote pharmaceutical care services.

Courses are offered at the University of Maryland at Baltimore campus in downtown Baltimore, and selected courses may be offered through distance education facilities throughout the state. Classes are planned for the fall, spring and summer semesters; however, first year students will always begin in the fall semester.

ADMISSIONS PROCESS

Application Deadline: April 1st

In order to be considered for admission to the nontraditional pathway, B.S. pharmacists (including pharmacists who graduated from international institutions) must:

- Be licensed in Maryland, the District of Columbia, or an adjacent state.
- Practice in Maryland, the District of Columbia or areas of surrounding states so that they have access to the pathway's mentoring system.
- Provide confirmation that they have access to patients for the purpose of meeting pathway requirements.

Once pharmacists have demonstrated that they meet these three criteria, they will be considered for admission. A description of required documentation and other elements of the admissions process will be provided in the application packet. Because of the highly interactive nature of the pathway, the school cannot accommodate more than 60 new students each year.

PROGRAM REQUIREMENTS

In addition to course work, the credit requirements of the nontraditional Pharm.D. pathway may be partially met through the following options:

TRANSFER

Nontraditional students may transfer up to six (6) credit hours of previous course work toward meeting the pathway requirements. This coursework must have been completed after the pharmacists have received their B.S. degrees and must be earned at an accredited university. The course work must also relate directly to curricular components of the nontraditional Pharm.D. pathway. Identification of potential transfer courses is done at the time of admission, or later if appropriate, through consultation between the student and the pathway coordinator. (Note: It is not possible to obtain additional PLA credit for transfer courses.)

PRIOR LEARNING ASSESSMENT (PLA)

The PLA process provides a mechanism through which credit may be earned. To be eligible for PLA credit, students must complete the course Prior Learning Assessment in Pharmacy Practice, have their portfolio evaluated by the PLA panel, and have a credit recommendation from the panel approved by the faculty. The PLA panel is comprised of school faculty and pharmacy practitioners. A maximum of 10 credits may be earned through this process. Credits are partitioned into four areas: Practice Management Planning (0-1); Community/Institutional Pharmaceutical Care (0-1); Pharmacotherapeutics (0-4); and Practice Management (0-4). These four areas correspond directly to curriculum components. The panel has developed assessment instruments for each of these areas.

All credits awarded by PLA will be confirmed during the *Experiential Learning Activities* as part of the evaluation of the terminal performance objectives. Credits awarded in Practice Management will be confirmed by the preparation of a set of practice management plans, consistent with outcome measures of the experiential learning course, Practice Management Planning. Credits awarded in Pharmacotherapeutics will be confirmed for each disease topic for which credit was received, using the seven explicit learning outcomes that form the basis for the PLA evaluation.

Upon awarding credit, the PLA panel will record a list of therapeutic topics to be confirmed as part of the experiential learning activities. Students and their mentors will be instructed that confirmation may be accomplished in any of the experiential learning courses, but must be completed prior to graduation from the program.

At the time when the student is ready to enter the final experiential learning clerkship (Community or Institutional Pharmaceutical Care) this list will be re-examined and completion of any disease topic that has not been confirmed will be required as part of this course.

CREDIT BY EXAMINATION

The university permits a credit by examination process for a course. Information about test-out options is provided by each coursemaster. A student who successfully completes the entire course by examination may register for credit by examination in the specific area; the current cost to the student is \$175 per course. Upon approval of the coursemaster, a student who successfully completes a discrete section of the examination may not be required to attend all class sessions and/or modules. In this case, the student must still register for the course and the results of the examination will be factored into the grade determination.

COURSE DESCRIPTIONS

Pharmacists entering the nontraditional pathway select one of two tracks based on the following broad classification: practice in *community* or *organized health care settings*. Presented below are detailed course descriptions for each course.

PRINCIPLES OF PHARMACEUTICAL CARE

PHNT 501—Principles of Pharmaceutical Care in Community Practice (3) (Kerr)

This course focuses on the processes involved in the delivery of pharmaceutical care by community pharmacists to patients with selected common disease states. Learning experiences include: development of a personal drug information library and provision of answers to questions from other health professionals and patients; evaluation of appropriateness of drug use; assessment of patients' drug therapies includ-

ing therapeutic response and possible adverse drug events; and development of action plans for delivery of specific patient services.

PHNT 502—Principles of Pharmaceutical Care in Organized Health Care Settings (3) (Finley)

The processes involved in the delivery of pharmaceutical care in organized health care settings are the focus of this course. Through the use of common disease state examples (e.g., pain management, pneumonias, lung cancer) students participate in a series of class discussions, case studies, selected reading assignments and projects which demonstrate processes which are fundamental to the delivery of pharmaceutical care. These processes include both programmatic (e.g., drug information, adverse drug reaction reporting and monitoring, formulary management, DUE, development of process and outcome indicators to apply quality improvement strategies to patient care) and patient-specific (e.g., symptom assessment, database development and interpretation, discharge counseling, monitoring, and care plan implementation) efforts which the student can apply in their own practice setting

THERAPEUTICS

PHNT 503—Ambulatory Therapeutics in Community Practice (3) (Kerr)

This course addresses the pharmacotherapy of common ambulatory drug therapy problems and the development and monitoring of pharmaceutical care plans for patients with these problems. Learning experiences include discussions of pharmacotherapy (both prescription and non-prescription), case study analysis, triage decision making and development of care plans. These experiences are focused on the participant's own pharmacy practice. Topics covered include Gastrointestinal Therapeutics, Cardiovascular Therapeutics, Principle of Oncology, Pain Management, Ambulatory Infectious Disease, Osteoporosis and Menopause.

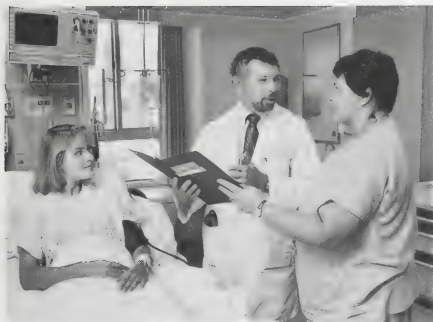
PHNT 504—Acute Care Therapeutics (3) (Hassan)

This course addresses the pharmacotherapy problems that occur primarily in acute care and organized health care settings, and the development and monitoring of pharmaceutical care plans for patients with these problems. Learning experiences include discussions of pharmacotherapy, case study analysis, adverse drug reaction analysis, discharge and transition of care planning, and development of care plans. These experiences are focused on the participant's own pharmacy practice. Topics include Gastrointestinal Therapeutics, Cardiovascular Therapeutics, Infectious Diseases, Cancer Chemotherapy and Endocrinology.

PRIOR LEARNING ASSESSMENT

PHNT 505—Prior Learning Assessment of Pharmacy Practice (2) (McPherson)

The objective of the course is to generate a documented compilation of a candi-



date's learning experiences and accomplishments - the Prior Learning Assessment (PLA) *Portfolio* - to be used to: identify strengths and weaknesses, individualize the learning plan, validate credits that satisfy program requirements, and grant academic credit when appropriate. The *Portfolio*, a requisite for matriculation in the non-traditional Pharm.D. pathway, will be developed under the direction of the coursemaster. Completion of the *Portfolio* is a requirement for the course. Evaluation of the *Portfolio* for the purposes of individualized curriculum development and the awarding of academic credit(s) (0-10) is conducted by a practitioner/faculty panel.

PRINCIPLES OF LITERATURE EVALUATION

PHNT 506—Principles of Literature Evaluation (2)

The goal of this course is to enable practitioners to critically read primary literature and apply the knowledge to the pharmaceutical care models developed in their practices.

INTEGRATED PHARMACEUTICAL SCIENCES

The scientific foundation of pharmacy practice is growing and changing at an ever increasing rate. While it is not possible for anyone to assimilate all of these changes, pharmacists must have the ability to apply new knowledge to help solve therapeutic problems and to comprehend new developments in science related to pharmaceutical care. The integrated pharmaceutical sciences component of the curriculum addresses this issue. Either of the following courses may be taken to satisfy this pathway requirement.

PHNT 507—Integrated Pharmaceutical Sciences Seminar (2)

The goal of this course is to further educate students in different areas of the pharmaceutical sciences and to help them use their scientific knowledge to understand

current issues. It will not provide a pharmaceutical science curriculum identical to that experienced by traditional students, but will expand their knowledge of the sciences and provide in-depth examples of pharmaceutical science topics relevant to the student's pharmaceutical care setting. Students research a topic, write a paper with a focus on the relevance to their area of practice and present a 30-45 minute seminar followed by class discussion. The topics are chosen from a list provided by the coursemaster or proposed by the student with coursemaster approval, and are driven by topics in current lay and/or scientific literature.

PHNT 510—Novel Drug Delivery Systems (2) (Hollenbeck/McPherson)

To enable students to make decisions about the appropriate use of novel drug delivery systems from an integrated science and practice perspective, basing the decisions on the physical, chemical, therapeutic and economic attributes of these systems. After completion of this course, the pharmacist will be able to: **Describe** the biophysical rationale and attributes of selected novel drug delivery systems; **Implement** appropriate storage and distribution procedures to insure stability of the bioactive agent(s) and stability of the drug release mechanism; **Critically evaluate** claims made for a novel drug delivery system; **Provide** a recommendation for or against the use of a specific drug delivery system for a specific patient's therapy, to a prescriber, on a rational scientific and therapeutic basis; **Counsel** patients with regard to the appropriate use of each delivery system.

PHARMACOTHERAPEUTICS

PHNT 540—Pharmacotherapeutics (4) (Vanderhaven)

Each student in this course is to meet the learning objectives set forth for six units to assure breadth of content. These units are in addition to those topics covered in the initial core coursework (e.g., Principles of Pharmaceutical Care and Therapeutics). Other units *may be included or developed* to meet specific individual or pathway needs.

<i>Unit I:</i>	<i>ARTHRITIS</i>
<i>Unit II:</i>	<i>NEPHROLOGY</i>
<i>Unit III:</i>	<i>NEUROPSYCH</i>
<i>Unit IV:</i>	<i>HEMATOLOGY</i>
<i>Unit V:</i>	<i>AIDS</i>
<i>Unit VI:</i>	<i>DERMATOLOGY</i>
<i>Unit VII:</i>	<i>OPHTHALMOLOGY</i>
<i>Unit VIII:</i>	<i>RESPIRATORY DISEASE</i>
<i>Unit IX:</i>	<i>INFECTIOUS DISEASES II</i>
<i>Unit X:</i>	<i>ONCOLOGY II</i>



Students Marcia Benjamin and Jenifer Fan work w/Preceptor Diane White

PRACTICE MANAGEMENT

PHNT 511—Practice Management (4) (Fedder)

Practice Management is composed of four modules: Financial Management, Principles of Management, Marketing and Managing Pharmaceutical Care Services. These modules are designed to prepare the student for the practice management experiential component and to facilitate the student's ability to provide well-rounded management of their practice. These credits may be earned by traditional coursework, self-study or other faculty approved modalities identified with the student's advisor. When appropriate, credits in this area may be awarded through the PLA process.

EXPERIENTIAL LEARNING

Starting early in the required courses, students will develop a representative patient population in their practice site to be followed during the program and in the performance-based evaluation in the final clerkship. Beginning with the initial patient identified as a study case, students will learn to triage, develop explicit pharmaceutical care plans and initiate the patient management process. As they proceed, a longitudinal process will be used to monitor and assess their progress in practice.

Typically a faculty mentor will be assigned to each student to periodically assess the student's progress and provide continuous feedback. Some on-site observations will be conducted by the faculty mentor or his/her assignee. Since implementation of a new service should be cost effective, students will develop a resource assessment—e.g., personnel needs, space, equipment—propose a structure for compensation, and provide a marketing plan for the practice site.

While the central philosophy of the experiential learning program is to provide for an impact on patients in the pharmacist's own practice, it is anticipated that it will not always be possible to completely meet experiential learning objectives at that site. When it is necessary for exposure to the delivery of pharmaceutical care services at other practice sites, every effort will be made to schedule these visitations at convenient times.

PHNT 521—Longitudinal Care (1) (McPherson)

This experiential course focuses on assessing the health status of a cohort of patients in the student's own practice, developing health status reports, and participating in the management of pharmaceutical care needs of these patients during health transitions. Selected patients have health care problems (such as congestive heart failure, AIDS, cancer or problems with aging) that are likely to result in health transitions requiring changing pharmaceutical care needs including changes in drug therapy, health education, patient counseling and physical environment (e.g., home, long term care, hospital). It is expected that students commit a minimum of approximately 45 hours (e.g., an average of about 3 hours per week over a semester or 1.5 hours per week over an academic year) to experiential activities in this course at their own practice site. Students are expected to apply skills from this course in subsequent Pharmaceutical Care experiential coursework.

PHNT 531—Practice Management Planning (2) (Fedder)

Practice Management Planning will focus on the application of management principles to a pharmaceutical care service. The course will provide an opportunity for the student to develop and write a plan defining and justifying a pharmaceutical care service and an opportunity for implementing the plan.

PHNT 532—Patient Assessment Skills (1) (Michocki)

This experiential course focuses on the student acquiring skills necessary to obtain general pharmaceutical care data bases and problem-oriented data bases from patients. Acquired skills include both history-taking and physical assessment. Learning experiences include faculty demonstrations, videos, simulations and patient encounters. The course has six to seven four-hour workshop sessions and one clinic session with a mentor to practice acquired skills in a supervised environment. Students are expected to apply and practice skills from this course in the program's other experiential courses.

PHNT 534—Clinic or Institutional Assignment (1) (McPherson)

Activities in this course include supervised development of pharmaceutical care plans, triage decision making, discharge/transition planning and patient counseling. Students are assigned to a total of 15 three-hour faculty supervised pharmaceutical care sessions. Students whose area of interest is ambulatory practice are assigned to 11 three-hour Pharmacotherapy-Medication Refill Clinic sessions and four hospital-based three-hour Pharmaceutical Care Rounds sessions. Students whose area of interest is in organized or institutional health care are assigned to 11 hospital-based Pharmaceutical Care Rounds sessions and four Pharmacotherapy-Medication Refill Clinic sessions.

PHNT 536—Drug Information Experience (I) (Mays)

Pharmacists acquire and apply drug information skills in their own practice. Students will develop and attain their own drug information library, access appropriate drug information databases, and utilize appropriate pharmaceutical and medical literature to prepare drug information reports. Assignments are made based upon the needs of the patients in the student's practice and the organizational needs of the practice site.

Students usually enroll in this course concurrently with their Pharmaceutical Care and/or Longitudinal Pharmaceutical Care experiential course(s). It is expected that students commit a minimum of 45 hours to this course spread out over one or two semesters (an average of one and a half to three hours per week). It is preferable for students to link their drug information activities to their activities in the concurrent experiential course(s).

PHNT 560—Community or Institutional Pharmaceutical Care (4) (McPherson)

Pharmacists obtain and apply the skills to deliver pharmaceutical care services to patients in their own practice. Students develop and implement Triage Plans, Pharmaceutical Care Plans, and Transition Plans for a cohort of patients (in addition to the patients accumulated during the Longitudinal Care experience) in their own practice. Patients selected for plan development and implementation must have at least two pharmaceutical care or pharmacotherapy problems.

Students communicate these plans to other health care professionals, monitor the response of patients to these plans, make any necessary modifications, and assess health outcomes resulting from their plans. It is expected that students commit a minimum of approximately 180 hours (an average of about six hours per week over two semesters) to activities related to this course.

During this course, students will be held accountable for application of pharmacotherapy topics acquired through Prior Learning Assessment and the didactic Pharmacotherapeutics course. Students completing this course are expected to be able to demonstrate the nontraditional Pharm.D. pathway's terminal performance objectives related to implementation of pharmaceutical care services in their own practice site.

Academic Information

ACADEMIC SESSIONS

The School of Pharmacy operates on a four semester calendar. The fall term, four months long, begins immediately after Labor Day and runs to the Christmas recess. A three week winter minimester in January allows students to avail themselves of tutorial services or elective courses. The spring term, four months long, begins the last week in January and extends to just before Memorial Day. Full-time students enrolled in spring do not pay tuition and fees for the UMAB courses taken during the winter minimester. Student must pay additional winter minimester tuition at other UM campuses. Students taking didactic courses at UMAB or other UM institutions must pay summer session tuition and fees.

REGISTRATION POLICIES

CANCELLATION OF REGISTRATION

Students who register and subsequently decide not to attend the School of Pharmacy must provide written notice to the office of student affairs before the first day of class. If this office has not received a request for cancellation by 4:30 p.m. on the day before classes begin, the university will assume that students plan to attend and that they accept their financial obligation.

CHANGE IN REGISTRATION

A special add/drop form used for all changes in registration should be obtained from the office of student affairs. Students must consult with their academic advisor and obtain his/her signature on the add/drop form. The completed form must be returned to the office of student affairs. There is no charge for a change in registration. Students may not add a course after the first week of classes or drop a course after the midpoint of a particular course without written permission from the office of student affairs. The grade of "F" is given for courses dropped after the midpoint of the course.

LATE REGISTRATION

A late registration fee is charged to students who fail to complete registration by the specified time for regular registration (usually the day before the first day of classes).

WITHDRAWAL FROM THE UNIVERSITY

Students forced to withdraw from the university before the end of a semester are eligible for partial refunds depending upon the date of withdrawal. To ensure such refunds, students must file withdrawal forms in the school's office of student affairs. Failure to complete these forms will result in failing grades in all courses and forfeiture of the right to any refund.

GRADING SYSTEM

The School of Pharmacy uses the following grading system:

Grade	Interpretation	Point Value
A	Excellent	4
B	Good	3
C	Fair	2
D	Poor but Passing	1
P	Pass	0
F	Failure	0
I	Incomplete	Must be replaced by definite grade within one year
WD	Withdrawal	No grade is assigned

When, for any reason, a course is repeated, the grade achieved in the repeated course replaces all previous grades in the same course.

SCHOLASTIC HONORS

Academic excellence is recognized during the fall and spring honor convocations. During the fall ceremony, academic achievement awards are given to students in all classes based on performance the preceding year. The leaders of student organizations are also recognized at this time. The Rho Chi Honor Society presents its annual book award to the student(s) having the highest academic marks. The School of Pharmacy Achievement Awards are presented to individuals who have brought honor to the school by their career achievements.

In the spring, the school honors its graduates. Those in the first tenth of the class graduate with *high honors* and those in the second tenth of the class with *honors*. The faculty presents the achievement awards to members of the graduating class at the Spring Honors Convocation:

School of Pharmacy Gold Medal for General Excellence is awarded to the candidate who has attained the highest general average.

Certificates of Honor are given to the three students having the next highest general averages. *Only courses taken at the University of Maryland School of Pharmacy are considered in awarding these two awards.*

Andrew G. DuMez Award. In memory of Dr. Andrew G. DuMez, late dean and professor of pharmacy, Mrs. Andrew G. DuMez provided a gold medal which is awarded for superior proficiency in pharmacy.

Epsilon Alumnae Chapter, Lambda Kappa Sigma-Cole Award. This award, in memory of Dr. B. Olive Cole, former acting dean, is given for proficiency in pharmacy administration.

Kappa Chapter, Alpha Zeta Omega Fraternity Prize. The Kappa Chapter of the Maryland Alumni Chapter of the Alpha Zeta Omega (AZO) fraternity provides a prize which is awarded for proficiency in pharmacology.

Maryland Society of Hospital Pharmacists Award. MSHP honors annually a student who has been outstanding in the area of hospital pharmacy.

William Simon Memorial Prize. In honor of the late Dr. William Simon, who was a professor of chemistry in the School of Pharmacy for 30 years, a gold medal is awarded for superior work in the field of biomedical chemistry.

Dr. and Mrs. Frank J. Slama Scholarship Award. A fund has been established in honor of the late Dr. Frank J. Slama, a former professor of pharmacognosy. Income for the fund provides a plaque to be awarded for superior work in the field of biopharmacognosy.

Frank J. Slama Award by the School's Alumni Association. In memory and tribute to the late Dr. Frank J. Slama, class of 1924, a former professor and head of the department of pharmacognosy, for his loyalty and service of over half a century to his profession, to the School of Pharmacy and to the Alumni Association, the School of Pharmacy Alumni Association provides an annual award to a member of the graduating class who has excelled in extracurricular activities.

Wagner Pharmaceutical Jurisprudence Prize. In memory of her husband, Manuel B. Wagner, and her son, Howard J. Wagner, both alumni of the School of Pharmacy, the late Mrs. Sadie S. Wagner, together with her daughter, Mrs. Phyllis Wag-

ner Brill Snyder, provided a fund, the income of which is awarded for meritorious academic achievement in pharmaceutical jurisprudence.

John F. Wannewetsch Memorial Prize. In memory of her late brother, Dr. John F. Wannewetsch, a distinguished alumnus of the School of Pharmacy, Mrs. Mary H. Wannewetsch provided a fund, the income of which is awarded to a student who has exhibited exceptional performance and promise in the practice of community pharmacy.

The Conrad L. Wich Pharmacognosy Prize. In appreciation of the assistance which the Maryland College of Pharmacy extended to him as a young man, Mr. Conrad L. Wich provided a fund, the income from which is awarded annually by the faculty assembly to the student who has done exceptional work throughout the course in pharmacognosy.

L. S. Williams Practical Pharmacy Prize. The late L.S. Williams left a trust fund, the income of which is awarded to the student having the highest general average throughout the course in basic and applied pharmaceutics.

ACADEMIC STATUS POLICIES

The student affairs committee, class advisors and coursemasters are all concerned with student academic progress. Therefore, student performance in courses and clerkships will be monitored on an ongoing basis. Students are ultimately responsible for their own academic progress and, thus, must take advantage of the school's tutorial and advising systems when necessary. Within the school, there are several individuals that students should contact as soon as an academic problem arises or when a personal problem occurs that interferes with school work. Students should take the initiative to arrange a meeting first with their academic advisor and/or the coursemaster of a particular course where the problem is occurring. In addition, the class advisor, the director of student services, and other members of the faculty and administration are available to discuss problems. Experience has demonstrated that the more active students are in addressing potential problems, the more successful the resolution of those problems. By the same token, faculty members are encouraged to initiate discussions with students who demonstrate academic difficulty.

Failing grade: Students who fail a course or clerkship are subject to academic dismissal. As soon as a course or clerkship failure is reported to the office of student affairs, the student affairs committee will review the situation and will notify the student of their eligibility for dismissal. The student will then be asked to appear before the student affairs committee to discuss the situation. When appropriate, the committee will make recommendations to the faculty assembly regarding academic dismissal, academic probation or other action (see "Academic Dismissal" section for appropriate procedures).

ACADEMIC STATUS CRITERIA

(Nontraditional pathway students see following section)

GPA below 2.0: At the end of each semester, the student affairs committee will review the academic status of all students. Students who fail to maintain a semester GPA of 2.0 **and** have a cumulative GPA below a 2.0 are subject to academic dismissal and will appear before the student affairs committee. As stated above, the committee will make recommendations to the faculty when appropriate. Students who have semester GPAs below 2.0, but their cumulative GPA is 2.0 or above will receive a letter of warning.

Students on probation: If students on probation earn a GPA below a 2.0 during the probationary semester, they are subject to academic dismissal and will appear before the student affairs committee (see above). If students on probation earn a semester GPA of 2.0 or above, but their **cumulative** GPA is still below 2.0, they will continue on probation. Students will be removed from probation when their cumulative GPA is 2.0 or above. Students with a "F" on their record will remain on probation regardless of GPA until the failing grade is resolved. Students who are placed on academic probation have an option to continue on a reduced load (less than 9 hours). Students must have a cumulative GPA of at least a 2.0 in all required courses in the second and third years to enter the third and fourth years of the Pharm.D. program, respectively. Students cannot enter the third or fourth year while on probation or with an "F" in a required course. Students must maintain a cumulative grade average of 2.0 to become eligible for graduation.

ACADEMIC STATUS CRITERIA

(Nontraditional Pathway)

The minimum passing grade for required courses in the Nontraditional pathway is a "C". Students may not register for a course or a clerkship if they have received a grade below a "C" in a prerequisite for that course or clerkship. The student affairs committee will review the situation when a student receives a grade below a "C" in a required course or clerkship, an "F" in an elective course, or when the student's GPA falls below 2.0. In those situations students may be subject to academic dismissal, academic probation or other action.

ACADEMIC DISMISSAL

Failure to meet the school's academic or professional standards will result in academic dismissal. To appeal academic dismissal, students must write to the student affairs committee; students have the right to present their case in person before the committee. The decision on the appeal is forwarded by the committee to the faculty assembly. If the appeal is denied, students have the right to appeal directly to the dean. The dean's decision on academic dismissal is final. The academic dis-

missal appears on the student's permanent record following the dean's decision. All appeals must be completed before the beginning of the next semester. Students who have been academically dismissed once may petition the admissions committee for reinstatement after they have completed some form of remediation. Students who have been academically dismissed twice are not eligible for reinstatement.

ACADEMIC INTEGRITY

Students entering the profession of pharmacy are required to have exemplary standards of conduct. Absolute honesty is imperative for a health professional. The school and university have policy statements (listed in the back of this catalog) which reflect expected standards of behavior. Academic dishonesty will not be tolerated. Academic dishonesty includes:

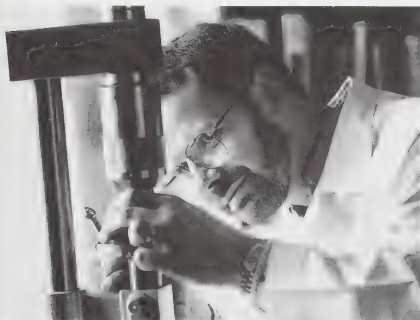
Cheating - using unauthorized notes, study aids or information from another individual during an examination

Plagiarism - submitting work that, in part or in whole, is not entirely the student's own; without attributing credit to correct sources

Fabrication - presenting data that were gathered outside the guidelines defining the appropriate methods of collecting and generating data

Falsification of records - altering documents affecting academic records; forging signatures; or falsifying any school or university document

Aiding or abetting dishonesty - providing material or information to another person with the knowledge that it will be used inappropriately



Dr. Richard Dalby

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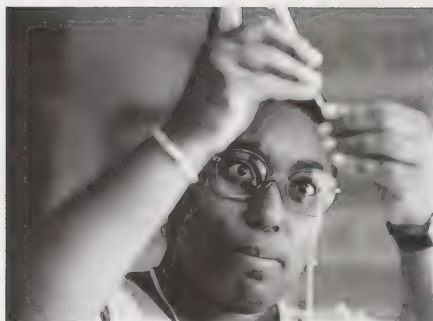
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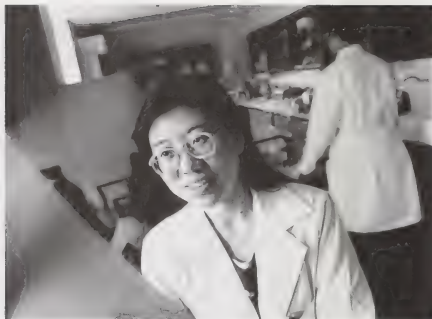
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John Beckman, B.S.P., Beckman's Greene Street Pharmacy
James Joseph Bellay, B.S.P., Prince George's Pharmacy
Bruce Benton, B.S.P., Edgehill Drugs Inc.
Brian Berryhill, B.S.P., Giant Pharmacy
Stephen Bierer, B.S.P., Giant Pharmacy # 1200
Johnnie Bingham, B.S.P., Kaiser Permanente Medical Center
Frank Blatt, B.S.P., NeighborCare/Powell's Pharmacy
Ruth Blatt, B.S.P., NeighborCare Pharmacies Inc.
Barry Bloom, B.S.P., Giant Pharmacy
Arnold Blaustein, B.S.P., Associated Prescription Services
Thomas Bolt, B.S.P., The Medicine Shoppe

Gene Borowski, B.S.P., Village Pharmacists
Cynthia Boyle, B.S.P., Thrift Drug
John Braaten, B.S.P., Twin Knolls Pharmacy
Lynette Bradley, B.S.P., CVS #452
Thomas Brenner, B.S.P., York Hospital
Barry Bress, B.S.P., NeighborCare Pharmacies Inc.
Steven Buckner, B.S.P., Magiros Pharmacy
Patrick Burke, B.S.P., Chestnut AID Pharmacy
Alvin Burwell, B.S.P., Alexandria Pharmacy
Kelly Keelan Caccamisi, B.S.P., K-Mart Pharmacies
Douglas Campbell, B.S.P., The Medicine Shoppe
Robert H. Campbell, B.S.P., Madison Park Pharmacy
Majorie Carl, LCSW, Baltimore County Department of Health
Thomas Carroll, B.S.P., NMC Home Care
Leon Catlett, B.S.P., Eakles Drug Store
Mark Chamberlain, B.S.P., Walter Reed Army Medical Center
David R. Chason, B.S.P., Good Samaritan Hospital
Fred Chatelain, B.S.P., M.S., Alexandria Hospital
Wen-Kuang Chen, B.S.P., Group Health Association
Fred Choy, M.S., R.Ph., Caremark
Thomas Chuen, M.S., Greater Southeast Community Hospital
Gerald I. Cohen, B.S.P., Rite Aid Pharmacy
David Cowden, B.S.P., CVS #1435
James Crable, B.S.P., The Finan Center
Karen Cranford, B.S.P., CVS # 1515
Laura Cranston, B.S.P., National Association of Chain Drug Stores
Daniel L. Crerand, B.S.P., Family Health Apothecary Inc.
Terry Crovo, B.S.P., Medical Center of Dundalk
Wayne Crowley, B.S.P., M.B.A., Giant Pharmacy
Hedy Cylus, B.S.P., Fenwick Apothecary
Traci Davis, R.Ph., CVS
Morrell Delcher, B.S.P., Maryland General Hospital
Dolores Dixon, B.S.P., University of Maryland Cancer Center
Joseph Dorsch Jr., B.S.P., Voshell's Pharmacy
Patricia Draper, B.S.P., Edward's Pharmacy
Janice Dunsavage, B.S.P., Capital Health System Hospital
Augustine R. Durso, B.S. Pharm., IV Tx
Innocent Egbunine, B.S.P., Kaiser Permanente Medical Center
Amy Elbers, B.S.P., Johns Hopkins Hospital
Kenneth Ey, B.S.P., East Baltimore Medical Center
Beth Fabian, B.S.P., K-Mart Pharmacy
Darlene Fahrman, B.S.P., Wal-Mart Pharmacy
Denise Farmer, B.S.P., Kaiser Permanente Medical Center
Neil Feldman, B.S.P., New Windsor Pharmacy
Philip Fiastro, B.S.P., Weis Pharmacy # 128
Barry Flannelly, B.S.P., Johns Hopkins Hospital

Anthea Francis, B.S.P., Johns Hopkins Hospital
Jeffrey P. Franklin, B.S.P., VA Medical Center - Ft. Howard
Kate Frazer, B.S.P., Johns Hopkins Hospital
Louis Friedman, B.S.P., Marcus Pharmacy
David Gerrold, B.S.P., Giant Pharmacy
Nancy Gilbert-Taylor, B.S.P., Fuller Medical Center Pharmacy
Harvey Goldberg, B.S.P., Freedom Drug
Leonard Goldberg, B.S.P., Dofield Pharmacy
Marvin Goldberg, B.S.P., Giant Pharmacy # 1158
Millard Gomez, B.S.P., Holy Cross Hospital
Thomas Goolsby, B.S.P., Medicine Shoppe
Karen Anderson Grace, B.S.P., HOMEDCO Infusion Company
Charles Graefe, B.S.P., Giant Pharmacy
Gary Greenberg, B.S.P., Edgehill Drugs, Inc.
Franklin Grollman, B.S.P., NCI - Navy Medical Oncology Branch
Robert Grossman, B.S.P., Giant Pharmacy #1054
Robert Gunn, B.S.P., Careline of Maryland Inc.
Douglas Haggerty, B.S.P., The Medicine Shoppe
John Hale, B.S.P., Rite Aid Pharmacy #2585
Mayer Handelman, B.S.P., Woodhaven Pharmacy and Medical Equipment
Stuart Hankin, B.S.P., Northern Nursing Home Pharmacy
Jon (Wes) Hann, B.S.P., REVCO
Mahtab Hariri-Salehi, B.S.P., University of Maryland Medical System
Roger Heer, B.S.P., Valley Pharmacy
Frank Henderson, B.S.P., Klein's of Bel Air
Jerry Herpel, B.S.P., Deep Creek Pharmacy
Joseph High, B.S.P., National Cancer Institute
J. Todd Holland, B.S.P., Boonesboro Pharmacy
Paul Holley, B.S.P., Tuxedo Pharmacy
Brad Homman, B.S.P., Naval Hospital Patuxent River
Stephen Hospodavis, B.S.P., Steve's Pharmacy
Thomas Jackson, B.S.P., St. Mary's Hospital
Robert Johnson, B.S.P., Rite Aid Pharmacy
Thomas Johnson Jr., B.S.P., Giant Pharmacy # 1175
Ramon Juta, B.S.P., Rite Aid Pharmacy
John Kamberger, B.S.P., Harford Memorial Hospital
Robert R. Kantorski, B.S.P., Ritchie Pharmacy
Albert Katz, B.S.P., Arundel Pharmacy
Larry D. Kelley, B.S.P., Nationwide Pharmacy Center
James Kenny, B.S.P., Virginia/Maryland Regional Veterinary College
Daniel Keravich, M.S., NIH
Edward Kern, B.S.P., Giant Pharmacy
Lori Keys, B.S.P., Johns Hopkins Hospital
Crystal King, B.S.P., MGH Pharmacy
David King, B.S.P., Georgetown Infusion Center
Larissa Kitenko, B.Sc., Peninsula Regional Medical Center

David Knauer, B.S.P., Johns Hopkins Bayview Medical Center
Jay Krosnick, B.S.P., ASCO Healthcare Inc.
Edmond Kucharski, B.S.P., Carroll County Hospital
John Kudrick, B.S.P., Family Pharmacy
Scott Kuperman, B.S.P., Crain Towers Pharmacy
Earl Labatt, M.A., VA Medical Center - Washington, D.C.
Steve Lauer, B.S.P., Giant Pharmacy
Gary Lawrence, B.S.P., Lawrence Pharmacy
Louise Leach, B.S.P., Northwest Hospital Center
Weiraymond Lee, B.S.P., CVS # 1444
Laura Lehman, Pharm.D., Union Memorial Hospital
Mark Lenes, B.S.P., NorthWest HealthCare
Melvin Lessing, B.S.P., FDA Office of OTC Evaluation
John Levchuk, B.S.P., Office of Compliance
Mark Levi, B.S.P., Medical Arts Pharmacy
Bonnie Levin, Pharm.D., Laurel Regional Hospital
Joseph Libercci, B.S.P., Park Avenue Pharmacy
Glenn Lichtman, B.S.P., Holabird Pharmacy
David Liebman, B.S.P., D.P.A., Kayes AID Pharmacy
Tim Lubin, B.S.P., NeighborCare Pharmacies Inc.
Heidi Lueking, B.S.P., Garrett County Memorial Hospital
Alonzo Mable, B.S.P., Group Health Association
Marie Mackowick, B.S.P., Crownsville Hospital Center
Peter Tabi Mbi, B.S.P., K-Mart Pharmacy #3167
John McArthur, B.S.P., Alaska Area Native Health Service
Stephanie McDaniel, B.S.P., CVS # 1500
Mark McDougall, B.S.P., McDougall's Pharmacy
Helen McFarland, B.S.P., Johns Hopkins Hospital
Colleen McGowan, B.S.P., Marrion Merrell Dow
Mary Mease, B.S.P., Ogden BioServices
Janet Mighty, B.S.P., Mercy Medical Center
Charles Mihalik, B.S.P., Maryland General Hospital
Penny Miles, B.S.P., CVS #1458
Harvey Miller, B.S.P., Rite Aid #352
David Miller, B.S.P., Maryland Pharmacists Association
Martin Mintz, B.S.P., Northern Pharmacy and Medical Equipment
Kimberly Moore, B.S.P., Paradise Pharmacy
Lynn Steele Moore, M.T., Medical Center of Delaware
Jeffrey Moyer, B.S.P., Waynesboro Hospital
Charles Muendlein, B.S.P., Lykos Pharmacy
Wendy Munroe, B.S.P., Health Outcomes
Kevin Musto, B.S.P., Edgehill Drugs Inc.
Timothy Muth, B.S.P., Syncor Medical Services Group
Louis Myers, B.S.P., Harbor Hospital Center
Linda Nadal-Hermida, B.S.P., K-Mart Pharmacy
Cecilia Nathan, B.S.P., Liberty Medical Center

Leon Nelson, B.S.P., Rite Aid
John R. Newcomb, B.S.P., Nationwide Pharmacy
Joseph Nusbaum, B.S.P., Ambulatory Care Pharmacy
Sandra Oliver, B.S.P., Johns Hopkins Hospital
John Ominski, B.S.P., Walter Reed Army Medical Center
Michael J. Orsini, B.S.P., University of Maryland Medical Systems
Helen Osborn, B.S.P., Montgomery General Hospital
Richard Ottmar, M.S., Sacred Heart Hospital
Mercy Owoh, B.S.P., Kaiser Permanente Medical Center
Joseph Pariser, B.S.P., Giant Pharmacy
Daniel Pastorek, B.S.P., Kay Cee Drugs
Sailesh Patel, B.S.P., Horizons Professional Pharmacy
David Patterson, B.S.P., Memorial Hospital
Robert Patti, B.S.P., Hanover General Hospital
Martin Paul, B.S.P., Jacksonville Pharmacy
Carol Paulick, B.S.P., St. Agnes Hospital
Normand Pelissier, B.S.P., Church Hospital
James Pellenbarg, B.S.P., Drug Counter
David Perrott, B.S.P., Mount Washington Pediatric Hospital
Mark Pilachowski, B.S.P., Rite Aid Pharmacy
Bonnie Pitt, B.S.P., Frederick Memorial Hospital
Howard Pollack, B.S.P., Towson Pharmacy
David Posner, B.S.P., Giant Pharmacy # 1053
John Pycha, B.S.P., Woodhaven Pharmacy
Jacob Raitt, B.S.P., Weiner's Pharmacy
Patricia Richards, B.S.P., Group Health Association
Stephen Rigglin, B.S.P., MacGillivray's of Paca
Arthur Riley, M.S., Washington Heights Medical Center Pharmacy
Carol Ritchie, B.S.P., The Thomas B. Finan Center
Michael D. Roberts, B.S.P., National Rehabilitation Hospital
Michael Roberts, B.S.P., Annapolis Professional Pharmacy
David Rochlin, B.S.P., Giant Pharmacy # 1074
Jeffrey Rodkey, B.S.P., Rite Aid #335
Leon Rosen, B.S.P., Kaufmann's of Kenilworth
Dennis Rosenbloom, B.S.P., Rexall Pharmacy
Richard Rumrill, M.S., Howard County General Hospital
Cyrus Samet, B.S.P., Bon Secours Hospital
Brian Sanderoff, B.S.P., Sappe's Pharmacy
Daniel Satsky, B.S.P., MacGillivray's Pharmacy
Angelica Schneider, B.S.P., NeighborCare Pharmacy Inc.
Kenneth Schneider, B.S.P., Safeway Pharmacy
Joseph Schuman, B.S.P., Maryland Rehabilitation Center
Brian Schumer, B.S.P., Penn-Dol Pharmacy
Donald A. Schumer, B.S.P., Penn-Dol Professional Pharmacy
Gregory Shaeffer, B.S.P., The Milton S. Hershey Medical Center
Brent Sharf, B.S.P., Bon Secours Hospital

Kelly Shaner, B.S.P., The Pharmacy at Fairmont Hill
 Winette Sherard, B.S.P., Walter P. Carter Center
 Bertram Shevitz, B.S.P., Rite Aid
 Robert Sinker, B.S.P., Potomac Village Pharmacy
 Dennis Smith, B.S.P., Greater Baltimore Medical Center
 John C. Smith, B.S.P., Giant Pharmacy
 Sue Smith-Walls, B.S.P., Edgehill Drugs, Inc.
 Jennifer Snyder-Rowan, B.S.P., Thrift Drug
 Gary Sobotka, B.S.P., CVS
 Joseph Sokol Jr, B.S.P., Twin Knolls Pharmacy
 Raymond Spassil, M.S., Memorial Hospital
 Samuel Speedone, B.S.P., Frostburg Hospital
 Carol Stevenson, B.S.P., Fallston Hospital
 Jerry Stewart, B.S.P., Memorial Hospital
 Gary Ross Stout, B.S.P., Safeway Pharmacy # 1423
 Marla Surgent, B.S.P., Calvert Arundel Pharmacy
 William Tabak, B.S.P., Rite Aid Pharmacy
 Karen Tafoya, B.S.P., Southgate Professional Pharmacy
 Peter Tam, B.S.P., Calvert Memorial Hospital
 Richard Tarr, B.S.P., Giant Pharmacy #1074
 James Tauer, B.S.P., Crownpoint Indian Hospital
 Lawrence Taylor, B.S.P., REVCO #2707
 J. Bradley Thomas, B.S.P., The Medicine Shoppe
 Jodie Thomas, B.S.P., The Medicine Shoppe
 Vito Tinelli Jr., B.S.P., Chestertown Pharmacy
 Brian Trentler, B.S.P., Johns Hopkins Hospital
 Penelope Trikeriotis, B.S.P., Giant Pharmacy # 1211
 Kathleen Truelove, B.S.P., Johns Hopkins Hospital
 Leila Valencia, B.S.P., NeighborCare Pharmacies Inc.
 John VanWie, B.S.P., Safeway Pharmacy
 Wayne VanWie, B.S.P., Safeway Pharmacy # 1281
 Rebecca A. Viola, B.S.P., Walter Reed Army Medical Center
 Doris R. Voigt, B.S.P., Kimbrough Army Community Hospital
 Dorothy Wade, B.S.P., Nat'l Pharmaceutical Council
 Ken Walters, Pharm.D., Sheppard Pratt Hospital
 Richard Wankel, B.S.P., Howard and Morris
 Pamela Waring, B.S.P., Group Health Association
 Robyn Warnick, B.S.P., V.A. Medical Center - Ft. Howard
 Jasper Watkins III, B.S.P., Walter Reed Army Medical Center
 Donald Way, B.S.P., North Arundel General Hospital
 C. Edwin Webb, Pharm.D., M.P.H. American Association of Colleges of
 Pharmacy
 David Weetman, B.S.P., Johns Hopkins Hospital
 Joann N. Wehnert, B.S.P., Apple Drug
 Michael Weinstein, B.S.P., The Apothecary
 Debra S. Weintraub, Pharm.D., Suburban Hospital

Robert Whalen, B.S.P., Wal-Mart Pharmacy
Thomas Wieland, B.S.P., Maxor Pharmacy
Stephen Wiener, B.S.P., Medical Arts Pharmacy
Lewis E. Williams, B.S.P., York Hospital
Thomas Wilson, B.S.P., Cape Drug
Thomas Williams, B.S. Pharm., Medical Center of Dundalk
Deborah Winkel, M.A., Barre-National/AXL Laboratory
Jane Wuenstel, B.S.P., Washington Adventist Hospital
Ellen Yankellow, B.S.P., Choice Drug of Maryland
Martin Yankellow, B.S.P., Rite Aid Pharmacy
Irvin Yospa, B.S.P., Family Pharmacy of Hampstead
Deirdre Younger, B.S.P., Health Center Pharmacy
Jonas J. Yousem, B.S.P., Wilde Lake Pharmacy
Faramarz Zarfeshanfard, B.S.P., Johns Hopkins Hospital



Policy Statements

UNIVERSITY OF MARYLAND AT BALTIMORE MISSION STATEMENT

The University of Maryland at Baltimore (UMAB) aspires to advance knowledge in health care, law, social welfare and related disciplines through research, teaching and service; to promote partnerships and develop interdisciplinary/interprofessional programs that address critical issues in these areas; to assist in the integration and transfer of new knowledge; and to play a significant role in shaping health care, legal and social services for Maryland and the mid-Atlantic region. UMAB's principal goal is to become a center of focused excellence in professional, graduate and continuing education and to promote excellence in research and scholarship, both basic and applied.

Located in downtown Baltimore, UMAB is the public institution in Maryland responsible for providing caring and competent professionals in dentistry, law, medicine, nursing, pharmacy and social work. It also offers combined degree programs and is developing other interprofessional joint degree programs. Along with its three major partners (the University of Maryland System, the Baltimore Veterans Affairs Medical Center, and the Medical Biotechnology Center), UMAB is one of the fastest growing biomedical research centers in the nation and plays an important role in strengthening the infrastructure of the regional economy.

As a constituent institution of the University of Maryland System, UMAB practices affirmative action, cooperates with other educational segments in Maryland, collaborates with other UMS institutions to provide citizens access to high quality educational services and serves the educational, economic and cultural needs of Maryland.

UMAB and UMBC administer the programs of the University of Maryland Graduate School, Baltimore (UMGSB), one of the UMS_ two principal centers for research and doctoral level training. While specific criteria for achieving excellence vary from school to school, UMAB expects its faculty to teach, to conduct research, and to practice their professional skills through clinical service, community interaction and scholarship.

FACULTY, STUDENT AND INSTITUTIONAL RIGHTS AND RESPONSIBILITIES FOR ACADEMIC INTEGRITY

Preamble

The academic enterprise is characterized by reasoned discussion between student and teacher, a mutual respect for the learning and teaching process, and intellectual honesty in the pursuit of new knowledge. By tradition, students and teachers have certain rights and responsibilities which they bring to the academic community. While the following statements do not imply a contract between the teacher

or the institution and the student, they are nevertheless conventions which should be central to the learning and teaching process.

I. Faculty Rights and Responsibilities

- A. Faculty members shall share with students and administrators the responsibility for academic integrity.
- B. Faculty members shall enjoy freedom in the classroom to discuss subject matter reasonably related to the course. In turn, they have the responsibility to encourage free and honest inquiry and expression on the part of students.
- C. Faculty members, consistent with the principles of academic freedom, have the responsibility to present courses that are consistent with their descriptions in the catalog of the institution. In addition, faculty members have the obligation to make students aware of the expectations in the course, the evaluation procedures and the grading policy.
- D. Faculty members are obligated to evaluate students fairly, equitably and in a manner appropriate to the course and its objectives. Grades must be assigned without prejudice or bias.
- E. Faculty members shall make all reasonable efforts to prevent the occurrence of academic dishonesty through appropriate design and administration of assignments and examinations, careful safeguarding of course materials and examinations, and regular reassessment of evaluation procedures.
- F. When instances of academic dishonesty are suspected, faculty members shall have the responsibility to see that appropriate action is taken in accordance with institutional regulations.

II. Student Rights and Responsibilities

- A. Students share with faculty members and administrators the responsibility for academic integrity.
- B. Students have the right of free and honest inquiry and expression in their courses. In addition, students have the right to know the requirements of their courses and to know the manner in which they will be evaluated and graded.
- C. Students have the obligation to complete the requirements of their courses in the time and manner prescribed and to submit to evaluation of their work.
- D. Students have the right to be evaluated fairly, equitably, and in a timely manner appropriate to the course and its objectives.
- E. Students shall not submit as their own work any work which has been prepared by others. Outside assistance in the preparation of this work, such as librarian assistance, tutorial assistance, typing assistance or such special assistance as may be specified or approved by the appropriate faculty members, is allowed.
- F. Students shall make all reasonable efforts to prevent the occurrence of academic dishonesty. They shall by their own example encourage academic

integrity and shall themselves refrain from acts of cheating and plagiarism or other acts of academic dishonesty.

- G. When instances of academic dishonesty are suspected, students shall have the right and responsibility to bring this to the attention of the faculty or other appropriate authority.

III. Institutional Responsibility

- A. Constituent institutions of the University of Maryland System shall take appropriate measures to foster academic integrity in the classroom.
- B. Each institution shall take steps to define acts of academic dishonesty, to ensure procedures for due process for students accused or suspected of acts of academic dishonesty, and to impose appropriate sanctions on students found to be guilty of acts of academic dishonesty.
- C. Students expelled or suspended for reasons of academic dishonesty by any institution in the University of Maryland System shall not be admissible to any other UMS institution if expelled, or during any period of suspension.

CONFIDENTIALITY AND DISCLOSURE OF STUDENT RECORDS

It is the policy of the University of Maryland at Baltimore to adhere to the Family Educational Rights and Privacy Act (Buckley Amendment). As such, it is the policy of the university (1) to permit students to inspect their education records, (2) to limit disclosure to others of personally identifiable information from education records without students' prior written consent and (3) to provide students the opportunity to seek correction of their education records where appropriate. Each school shall develop policies to ensure that this policy is implemented.

SCHEDULING OF ACADEMIC ASSIGNMENTS ON DATES OF RELIGIOUS OBSERVANCE

It is the policy of the University of Maryland at Baltimore to excuse the absence(s) of students that result from the observance of religious holidays. Students shall be given the opportunity, whenever feasible, to make up, within a reasonable time, any academic assignments that are missed due to individual participation in religious observances. Opportunities to make up missed academic assignments shall be timely and shall not interfere with the regular academic assignments of the student. Each school/academic unit shall adopt procedures to ensure implementation of this policy.

ELIGIBILITY TO REGISTER AT UMAB

A student may register at UMAB when the following conditions are met: (1) the student is accepted to UMAB, (2) the student has received approval from the unit academic administrator and (3) the student has demonstrated academic and financial eligibility.

REVIEW OF ALLEGED ARBITRARY AND CAPRICIOUS GRADING

It is the policy of the University of Maryland at Baltimore that students be provided a mechanism to review course grades that are alleged to be arbitrary or capricious. Each school/academic unit shall develop guidelines and procedures to provide a means for a student to seek review of course grades. These guidelines and procedures shall be published regularly in the appropriate media so that all faculty and students are informed about this policy.

THE UNIVERSITY OF MARYLAND POSITION ON ACTS OF VIOLENCE AND EXTREMISM WHICH ARE RACIALLY, ETHNICALLY, RELIGIOUSLY OR POLITICALLY MOTIVATED

The Board of Regents strongly condemns criminal acts of destruction or violence against the person or property of others. Individuals committing such acts at any campus or facility of the university will be subject to swift campus judicial and personnel action, including possible suspension, expulsion or termination, as well as possible state criminal proceedings.

SERVICE TO THOSE WITH INFECTIOUS DISEASES

It is the policy of the University of Maryland at Baltimore to provide education and training to students for the purpose of providing care and service to all persons. The institution will employ appropriate precautions to protect providers in a manner meeting the patients' or clients' requirements, yet protecting the interest of students and faculty participating in the provision of such care or service.

No student will be permitted to refuse to provide care or service to any assigned person in the absence of special circumstances placing the student at increased risk for an infectious disease. Any student who refuses to treat or serve an assigned person without prior consent of the school involved will be subject to penalties under appropriate academic procedures, such penalties to include suspension or dismissal.

HUMAN RELATIONS CODE

Article I—Purpose

A. The University of Maryland at Baltimore (UMAB) is committed to the principles of free inquiry. It is also committed to human service. These commitments imply respect for all people, irrespective of any personal characteristics, and evaluation and advancement of individuals on the basis of their abilities and accomplishments with regard to all university matters.

UMAB affirms its commitment to a policy of eliminating unlawful discrimination on the basis of race, color, creed, sex, sexual orientation, marital status, age, ancestry or national origin, physical or mental handicap or exercise of rights secured by the First Amendment of the United States Constitution. UMAB also is committed to eliminating unlawful sexual harassment, which is recognized as sex discrimination. UMAB will not condone racism, bigotry or hatred in any form directed to any individual or group of individuals under any circumstances.

B. UMAB establishes this Human Relations Code consistent with the policies of the Board of Regents of the University of Maryland System. The specific purpose of this Code is to prevent of eliminate discrimination which is unlawful. This goal is to be accomplished through educational programs and through existing grievance procedures.

Article II—Scope of the Code

A. This Code prohibits unlawful discrimination by the university, or by those using university facilities, with respect to employment, student placement services, promotion, or the award of academic or economic benefits on the basis of race, color, creed, sex, sexual orientation, marital status, age, ancestry or national origin, physical or mental handicap, or the exercise of rights secured by the First Amendment of the United States Constitution. The code does not apply to potential students, potential employees and to business relations between the university and other individuals or organizations.

B. Nothing in this Code shall be construed to prohibit adoption of requirements cleanliness, neatness, uniforms, or other prescribed standards when uniformly applied for admittance to any facility for participation in clinical education or clinical activities, or when a standard is required in the interest of public relations or to avoid danger to the health, welfare or safety of any individual, including students, employees, or the public.

C. Exceptions

1. The enforcement of federal, State, or Baltimore City laws and regulation does not constitute prohibited discrimination for the purposes of this Code. Separate housing or other facilities for men and women, mandatory retirement age requirements, variations in benefit packages based on marital status, and religious and ethnic/cultural clubs are not prohibited.

2. This Code is not to be construed to alter the methods by which promotions in academic rank may be achieved or by which salaries of faculty or employees may be determined. However, if in the course of any grievance, it is alleged that discrimination has resulted in unfair application of stan-

dards of promotion or salary change, the appropriate fact finder may make a report to the campus authority responsible for making a final decision in the matter. The report will be advisory.

D. Specific activities subject to the Code.

The Code shall apply to the UMAB community in relation to activities including:

1. All educational, athletic, cultural and social activities occurring on the campus or at another location under UMAB's jurisdiction.
2. All services rendered by the campus to students, faculty and staff, such as job placement programs and off-campus listings of housing.
3. University sponsored programs occurring off-campus, including cooperative programs, adult education, including education and seminars.
4. Subject to limitations stated previously, employment relations between UMAB and all of its employees, including faculty.
5. The conduct of UMAB employees and their colleagues, supervisors or subordinates who are employed by UMAB's affiliates (e.g., UMMS). Although UMAB cannot directly control the behavior of affiliates' employees, UMAB will work with its affiliates to eliminate action by their personnel contrary to this code.

E. In the event of any questions about the applicability of the Code to a specific issue presented in a grievance, the UMAB president shall make the final decision concerning the scope of the Code.

Article III—Administrative Matters

This Code shall be effective July 1, 1987, or, if later, upon receipt of final approval (a) from the Chancellor of the University of Maryland System and, (b) with respect to form and legal sufficiency, from the Office of the Attorney General. This Code is subject to modification by the President with the approval of the Office of the Attorney General as to form and legal sufficiency. With regard to all issues, the Code shall be interpreted to be consistent with Board of Regents policies, with laws and regulations applicable to the university, and with the principles that final decisions with respect to academic promotions, establishment of salaries, and grading and evaluation of students shall be made by the academic community and not pursuant to this Code. (Last modified 7/93)

STUDENT SEXUAL HARASSMENT

UMAB policy prohibits sexual harassment of students by colleagues or faculty. Using the definition established by the United States Equal Employment Opportunity Commission, sexual harassment is defined as unwelcome sexual advances, unwelcome requests for sexual behaviors, and other behavior of a sexual nature. Proven harassment can result in disciplinary action including suspension or expulsion. Questions about peer or faculty behavior that may constitute sexual harassment may be directed to the Associate Dean of Student Affairs and Student Administration or to the Director of Student Services. Additional information on the definition, examples and remedies for sexual harassment are contained in the campus publication, *The Student Answer Book*.

No provision of this publication shall be construed as a contract between any applicant or student and the University of Maryland at Baltimore. The university reserves the right to change any admission or advancement requirement at any time. The university further reserves the right to ask a student to withdraw at any time when it is considered to be in the best interest of the university.

TO REACH THE CAMPUS

The university is located in downtown Baltimore, six blocks west of the Inner Harbor and two blocks north of Oriole Park at Camden Yards in the UniversityCenter district.

Directions

From I-95: Take Rte. 395 (downtown Baltimore) and exit onto Martin Luther King Jr. Blvd., staying in right lane. At fourth traffic light, turn right onto Baltimore St. Turn left at second traffic light onto Paca St. (get into right lane) and enter the Baltimore Grand Garage (on your right).

Bus

MTA routes 1, 2, 7, 8, 11, 20, 35 and 36 serve the campus.

Subway

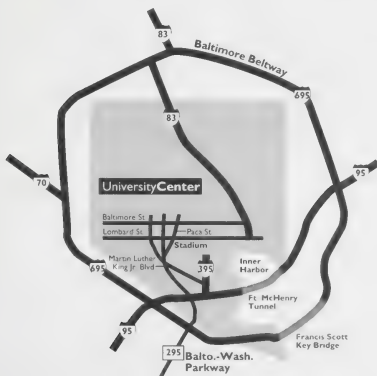
The Baltimore Metro runs from Charles Center to Owings Mills. Stops nearest the university are at Lexington Market and Charles Center.

Light Rail

Light rail connects park and ride locations in northern Baltimore County and Oriole Park at Camden Yards, then continues south to Glen Burnie. The UniversityCenter stop is two blocks east of campus on Baltimore Street.

Train

MARC commuter service runs from Camden Station, 301 W. Camden Street.



UniversityCenter Area, University of Maryland at Baltimore



VP Visitors Parking DP Dental Patient Parking PP Patient Parking SP Student Parking PO Parking Office

Academic, Administrative and Patient Care Facilities

- 19 Administration Building
737 West Lombard Street
- 17 Allied Health Building
100 Penn Street
- 13 Athletic Center
646 West Pratt Street
- 12 Baltimore Student Union
621 West Lombard Street
- 37 Biomedical Research Building
108 North Greene Street
- 38 (Walton P.) Carter Center
630 West Fayette Street
- 7 Davidge Hall
522 West Lombard Street
- 31 Dental School
666 West Baltimore Street
- 22 Dunning Hall
636 West Lombard Street
- 8 East Hall
520 West Lombard Street
- 20 Environmental Health and Safety Building
714 West Lombard Street
- 1 James T. Frenkel Building
16 South Eutaw Street
- 6 Greene Street Building
29 South Greene Street
- 28 Health Sciences Facility
685 West Baltimore Street
- 10 Health Sciences Library
111 South Greene Street

- 42 Hope Lodge
636 West Lexington Street
- 26 Howard Hall
660 West Redwood Street
- 36 Information Services Building
100 North Greene Street
- 33 Law School and Marshall Law Library
500 West Baltimore Street
- 9 Lombard Building
511 West Lombard Street
- 35 Maryland Bar Center
520 West Fayette Street
- 18 Medical Biotechnology Center
721 West Lombard Street

- 27 Medical School
Frank C. Bressler Research Building
655 West Baltimore Street
- 29 Medical School Teaching Facility
10 South Pine Street
- 15 Nursing School
655 West Lombard Street
- 24 Parsons Hall
622 West Lombard Street
- 40 Pascault Row
651-655 West Lexington Street
- 30 Pharmacy School
20 North Pine Street
- 41 Pine Street Police Station
214 North Pine Street
- 39 Ronald McDonald House
635 West Lexington Street
- 5 Social Work School
525 West Redwood Street
- 14 State Medical Examiner's Building
111 Penn Street
- 4 University Plaza
Redwood and Greene Streets
- 21 Western Health Center
700 West Lombard Street
- 23 Whitehurst Hall
624 West Lombard Street
- 2 405 West Redwood Street Building
- 16 701 West Pratt Street Building
- 11 University Health Center
120 South Greene Street
- 25 University of Maryland Medical System
22 South Greene Street
- 3 University of Maryland Professional Building
419 West Redwood Street
- 32 Veterans Affairs Medical Center
Baltimore and Greene Streets

Cultural and Civic Facilities

- 46 Babe Ruth Birthplace-Baltimore Orioles Museum
- 48 Dr. Samuel D. Harris National Museum of Dentistry (opening 1996)
- 44 Lexington Market
- 43 Market Center Post Office
- 47 Old Saint Paul's Cemetery
- 45 Oriole Park at Camden Yards
- 34 Westminster Hall

Parking Facilities

- VP Baltimore Grand Garage (visitors)
- DP Dental Patient Parking Lot (dental patients)
- SP Lexington Garage (students)
- PP University Plaza Garage (patients and patient transporters)
- P Public Parking Facilities

Assigned University Parking

- A Koester's Lots
- B Pearl Garage/Parking Office
- C Penn Street Garage
- D Pratt Street Garage
- E Other assigned parking areas

Student Right-to-Know and Campus Security Act Request

The Student Right-to-Know and Campus Security Act (Public Law 101-542), signed into federal law November 8, 1990, requires that the University of Maryland at Baltimore make readily available to its students and prospective students the information listed below.

Should you wish to obtain any of this information, please check the appropriate space(s), fill in your name, mailing address and UMAB school name, tear off this form and send it to:

University Office of Student Affairs
Attn: Student Right-to-Know Request
University of Maryland at Baltimore
Suite 336, Baltimore Student Union
621 West Lombard Street
Baltimore, MD 21201

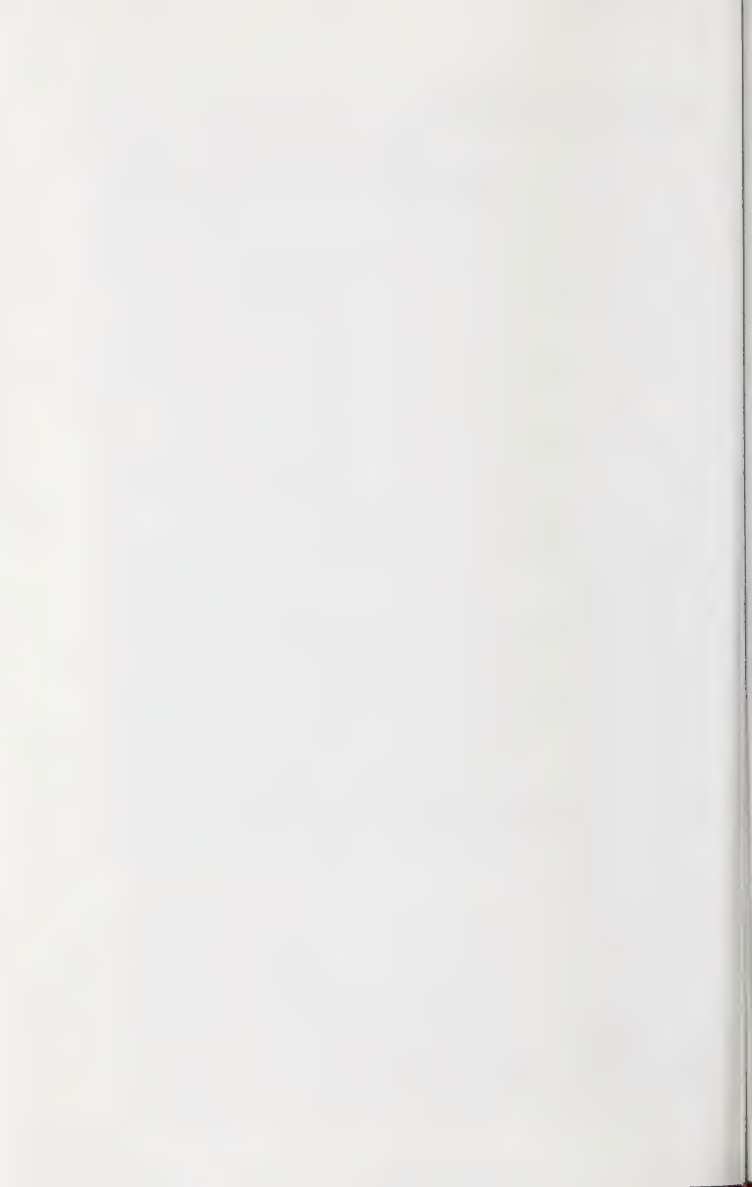
Complete and return this portion

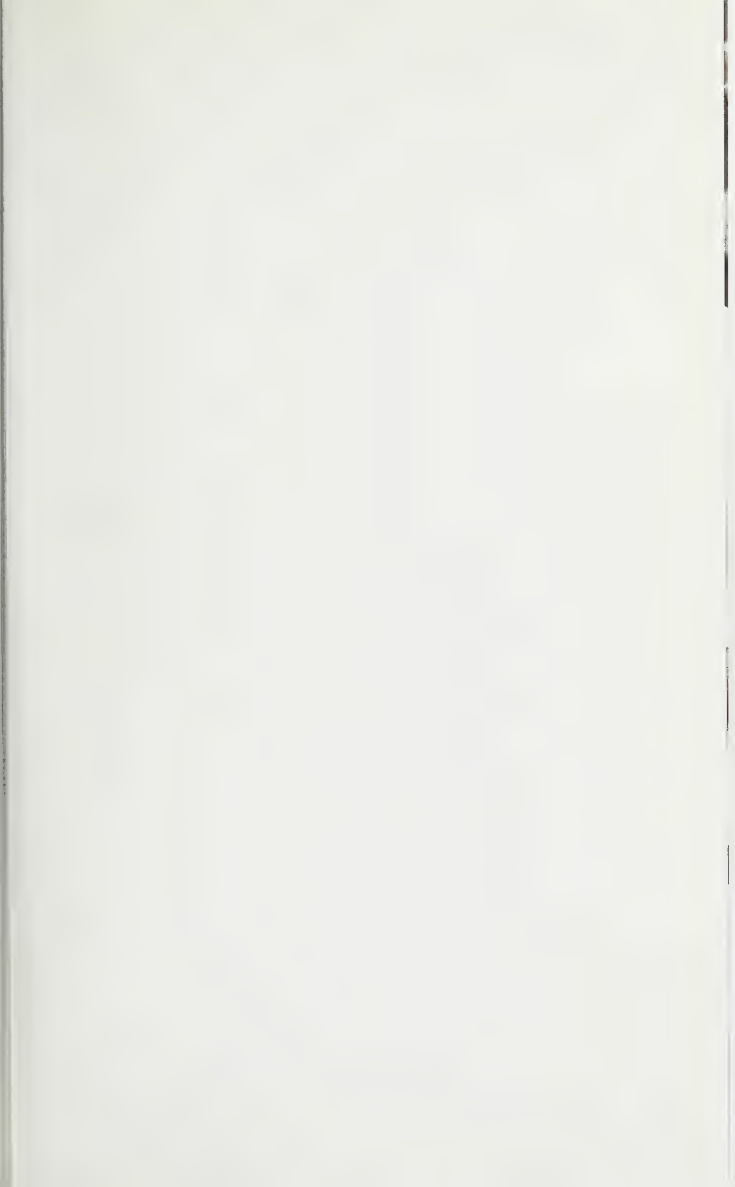
- Financial Aid
- Costs of Attending the University of Maryland at Baltimore
- Refund Policy
- Facilities and Services for Handicapped
- Procedures for Review of School and Campus Accreditation
- Completion/Graduation Rates for Undergraduate Students
- Loan Deferral under the Peace Corps and Domestic Volunteer Services Act
- Campus Safety and Security
- Campus Crime Statistics

Name _____

Address _____

UMAB School and Program _____







UNIVERSITY OF MARYLAND
AT BALTIMORE

Years 1997-1998 missing

The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that every entry should be supported by a valid receipt or invoice. This not only helps in tracking expenses but also ensures compliance with tax regulations.

In the second section, the author provides a detailed breakdown of the monthly budget. It includes categories for housing, utilities, food, and entertainment. Each category is further divided into sub-items, allowing for a granular view of where the money is being spent.

The third section focuses on investment strategies. It outlines the author's approach to diversifying their portfolio, including stocks, bonds, and real estate. The goal is to achieve long-term growth while managing risk.

Finally, the document concludes with a summary of the author's financial goals for the coming year. It includes targets for savings, debt reduction, and overall net worth. The author expresses confidence in their ability to meet these goals through disciplined financial management.



Doctor of Pharmacy 1999 - 2001 Catalog

University of Maryland • School of Pharmacy



1999-2001 Catalog
for Doctor of Pharmacy (PharmD) Program

Volume 60, Number 1
August 1999

University of Maryland
School of Pharmacy
20 N. Pine St.
Baltimore, MD 21201-1180

Program Information:	410-706-7653 or 800-852-2988 (Toll Free)
Admissions Office	<i>PharmDhelp@rx.umaryland.edu</i>
Nontraditional Pathway Info	410-706-0761
Dean's Office	410-706-7650
Financial Aid (UMB)	410-706-7347
Public Affairs	410-706-5893
Web site	<i>www.pharmacy.umaryland.edu</i>

The University of Maryland is accredited by the Middle States Association of Colleges and Schools. The School of Pharmacy's Doctor of Pharmacy (PharmD) programs and continuing education programs are accredited by the American Council on Pharmaceutical Education. [For additional information, contact ACPE, 311 W. Superior St., Chicago, IL 60610 (312-664-3575).] The school is a member of the American Association of Colleges of Pharmacy.

The University of Maryland is actively committed to providing equal educational and employment opportunity in all of its programs. It is the goal of the university to assure that women and minorities are equitably represented among the faculty, staff and administration of the university, so that its work force reflects the diversity of Maryland's population.

All employment policies and activities of the University of Maryland shall be consistent with federal and state laws, regulations and executive orders on nondiscrimination on the basis of race, color, religion, age, ancestry, national origin, sex, sexual orientation, handicap, marital status and veteran status. Sexual harassment, as a form of sex discrimination, is prohibited among the work force of the university.

1999-2001 Catalog

University of Maryland
School of Pharmacy

Doctor of Pharmacy Program

MESSAGE FROM THE DEAN

Dear Students and Colleagues:

Health-care delivery in today's society has been transformed. New medical technologies, new drugs, and new drug delivery systems are paving the way to a healthier world. Patients, who once had little say in their own health care, now have not only a desire but also the means to better understand their conditions and their medications. The Internet is providing everyone access to a wealth of information. And pharmacists—whether in community or hospital practice, the pharmaceutical industry, or government or nonprofit organizations—are playing a major role in developing new and innovative medicines, managing patient drug therapy, and helping patients understand and manage the plethora of information available about the medicines they take.



Pharmacy education is adapting to the demands of the changing health-care climate. A new philosophy has emerged with the goal of achieving outcomes that lead to the improvement of a patient's quality of life. In short, pharmacists educated to meet today's and tomorrow's health needs are concerned about how medications affect patients and the quality of life derived from those medications.

The University of Maryland School of Pharmacy has developed a curriculum that emphasizes problem-solving and critical thinking, and changes the focus from teaching to learning. Through innovative learning experiences—including flexibility in course structure, optional pathways offering concentrations in specific areas of a student's interest, expanded opportunities for electives, and shorter time-frames for coursework—Maryland students learn to practice as patient-oriented health-care providers who can work as part of a multiprofessional health-care team. Students have expanded use of information technology and the Internet which provides additional tools to enhance their learning.

Highlights of our strategic plan appear on page two. Our **core goals** embrace not only education but also research and scholarly efforts to make greater contributions to the discovery, development and use of medicines. The **cross-cutting goals** are intended to look beyond our own horizons to develop outreach programs and to support the practice of pharmacy in general.

I hope you find this catalog helpful as you browse through the course offerings and explore other information about our School of Pharmacy and the University of Maryland campus. For more current information, see our web site: www.pharmacy.umaryland.edu or write me at dknapp@rx.umaryland.edu.

David A. Knapp, PhD

Dean

University of Maryland School of Pharmacy

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THE UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY STRATEGIC PLAN

Through its education, research and service programs, the University of Maryland School of Pharmacy strives to improve the health and well-being of society by aiding in the discovery, development and use of medicines. Specifically, the goals and objectives of the School of Pharmacy include the following:

Core Goals

1. Educate pharmacists as lifelong learners through an excellent doctor of pharmacy curriculum, postdoctoral residency and fellowship programs and curricular-based adult education programs.
2. Strengthen the School's research and scholarly efforts in order to make greater contributions to the discovery, development and use of medicines.
3. Prepare graduates for careers in independent investigation in the pharmaceutical, clinical, social and administrative sciences through outstanding graduate education programs.
4. Provide cutting-edge clinical and population-based pharmaceutical care services to meet individual and community needs while supporting our education and research efforts.

Cross-cutting Goals

5. Serve as leaders for creativity and innovation for the profession of pharmacy in Maryland.
6. Improve the academic/work environment for students, staff and faculty of the School.
7. Extend the reach of the School by continuing to build international relationships in professional and graduate education, research and service.
8. Improve the School's information technology in order to enhance all of its programs.

GOALS OF THE DOCTOR OF PHARMACY CURRICULUM

The goals and objectives of the PharmD program are consistent with the School's strategic plan:

- *The School of Pharmacy seeks to help individuals gain the knowledge and skills necessary to begin pharmacy practice, and in so doing, accept and perform professional responsibilities with competence. Graduates should have the ability to adapt their practice to the changing health-care system and should be prepared to engage in a continuing program of professional development.*
- *The professional curricula will be innovative and flexible, based on strong basic sciences, have extensive clinical content taught by practice-based faculty and emphasize the development of problem solving and collaborative skills. The curricula also provided the opportunity for advanced professional and clinical education.*
- *The School seeks to create an educational community that extends beyond traditional classroom sites and offers students and faculty a variety of learning environments. These will include cultural and interprofessional programs which broaden the experiences of our graduates.*

The University of Maryland

The University of Maryland is the founding campus of Maryland's public university system and a thriving center of life sciences research and community service. Six professional schools and a graduate school educate research scientists and many of the region's health-care, law and social work practitioners.

With \$146 million in sponsored program support in 1998, the campus is one of the fastest-growing biomedical research centers in the country. The University is ideally configured to tackle complex health-care, public policy and societal issues. Our urban location and unique strengths create opportunities to comprehensively address regional problems. Often, our solutions have global implications. AIDS, aging, schizophrenia, hypertension, lead poisoning, cancer, child abuse and homelessness all are subjects of collaborative multidisciplinary research, scholarship and community action at the University.

New partnerships among University components and with the University of Maryland Medical System and Baltimore Veterans Affairs Medical Center are strengthening interdisciplinary endeavors in both research and teaching. Our proximity to Baltimore, Washington and Annapolis maximizes opportunities for collaboration with government agencies, health-care institutions and life sciences industries.

HEALTH SCIENCES AND HUMAN SERVICES LIBRARY

In 1998, the new state-of-the-art Health Sciences and Human Services Library opened at 601 West Lombard Street. The new facility tripled the floor space of the old library. In addition to its seating capacity of over 900, the library has three microcomputer teaching labs, a distance education center, over 50 public access workstations, 165 workstations and 40 small group study rooms. Although fully wired and networked, the building also provides comfortable couches and chairs, a cafe and beautiful ceremonial and historical rooms.

The Health Sciences and Human Services Library is distinguished as the first library established by a medical school in the United States, and is a national model of state-of-the-art information technology. The HS/HSL is the regional medical library for 10 southeastern states, the District of Columbia, Puerto Rico and the U.S. Virgin Islands as part of the National Network of Libraries of Medicine.

Serving all schools on campus and the University of Maryland Medical System, the library contains more than 325,000 volumes, including over 2,300 periodicals. It is among the 25 largest health sciences libraries in the country.

In addition to traditional services such as reference support and interlibrary loan, the HS/HSL offers an array of services including:

- Electronic access to the online catalog and over a dozen research databases including MEDLINE, PsycINFO, Aidsline, International Pharmaceutical Abstracts, Science Citation Index Expanded, Social Work Abstracts and others in support of campus curricula and programs.

- Electronic access for photocopy requests, interlibrary loans and book requests.
 - Online access to the reference desk *hsl@umaryland.edu* and the computer help desk *help@umaryland.edu*
 - An HS/HSL home page *www.umaryland.edu/hshsl* providing access to the library's full range of information and services.
 - An array of educational resources covering communication, computing, database and information management topics.
 - Consultation services to help find, use and manage online information resources more effectively.
 - Help in integrating information skills into curricula and courses.
 - Access to both Mac and DOS/Windows-based microlabs in the HS/HSL.
- To contact the library, call 410-706-7996 or write to *hsl@umaryland.edu*.

UNIVERSITY COMPUTER RESOURCES

Two Information Services units—Academic Computing/Health Informatics and Computing and Instructional Development Services—provide comprehensive microcomputer and mainframe computing support for faculty, staff and students.

IS resources for research, teaching and learning include an information commons area in the Health Sciences and Human Services Library. The commons offers 37 Windows-based machines and access to e-mail, databases, the World Wide Web, word processing, desktop publishing, spreadsheet and other software, as well as color printers and resources for preparing overheads or color slides.

The campus community has access to free e-mail accounts to communicate with others at the University and internationally by the Internet. The campus network, UMnet, also provides access to HS/HSL resources.

Computer help is available at 410-706-HELP (4357) or via e-mail, at *help@umaryland.edu*. Training workshops are available on a variety of computing information topics. Class schedules are published in the fall and spring. There are charges for some of the classes. Call 410-706-4763 for information. The campus community may use TAL Centers for application program training. Call the help desk for additional information on campus microcomputer locations, training, network resources and e-mail packages.

STUDENT AND EMPLOYEE HEALTH

Student and Employee Health provides comprehensive health care to students. The office is located at the University Family Practice, 29 South Paca Street. Staffed by family physicians and nurse practitioners, the office is open Monday through Thursday from 8:30 a.m. to 7 p.m., Friday from 8:30 a.m. to 4:30 p.m., and Saturday from 8:00 a.m. to noon.

Patients are generally seen by appointment (by calling 410-328-6645), although true emergencies can be seen on a walk-in basis. Doctors can be reached

after hours and on weekends at 410-328-8792. The doctor on call will arrange for examination and care of students needing after-hours care.

Gynecological services, including health maintenance (Pap smears, etc.), family planning and routine procedures, are provided by either the family physicians or the nurse practitioners. Birth control pills are available at a reduced cost for students receiving their GYN care through Student and Employee Health. Students' families also may receive care at this office through Family Medicine Associates, the clinical practice of the School of Medicine's Department of Family Medicine. For an appointment, call 410-328-6645; for information call 410-328-8792.

All full-time students must have health insurance. An excellent insurance policy providing wide coverage, including obstetrical care, is available through the University. The cost of most of the care provided at Student and Employee Health is covered largely by the student health fee.

Hepatitis B is an occupational illness for health-care providers. It has serious consequences and can even be fatal. Immunization against Hepatitis B is required for pharmacy, medical, medical technology, dental, dental hygiene and nursing students. The series of three immunizations is given through Student and Employee Health.

The staff of Student and Employee Health maintain strict confidentiality; no medical or other information is given to any source without the student's written permission.

COUNSELING CENTER

The Counseling Center provides professional individual and group counseling to students. Some of the more common problems that face students include stress, relationships, drugs or alcohol, eating disorders, loss of a loved one and difficult changes in school or home life.

Students are always seen by a professional—social worker, psychologist, psychiatrist or addictions counselor. Costs associated with seeing a therapist usually are covered by health insurance; however, no one is ever denied services based on inability to pay. Students are seen by appointment at 410-328-8404, and the center can accommodate students' class schedules in scheduling appointments. All Counseling Center services are completely confidential. The center is in the Baltimore Student Union, 621 West Lombard Street, Suite 218.

PARKING AND TRANSPORTATION

Campus parking is available to students. Commuting students must get a parking permit (cost: \$1), which permits parking on the campus but does not guarantee a parking space. Commuters can park at the Lexington Garage and Koester's open lot (Lexington and Pine Streets), at the current student rate (\$3.50/day) on a first-come, first-served basis. If spaces are unavailable, students will be directed to other lots.

Students who live on campus pay for parking by the semester or year and are guaranteed 24-hour parking in a garage adjacent to their residence facility. For more information about campus parking, write Parking and Commuter Services, University of Maryland, 622 W. Fayette St., Baltimore, MD 21201 or call 410-706-6603.

The campus also sponsors a "Caravan" shuttle bus service that transports students from designated areas on campus to the main parking facilities and to several nearby neighborhoods. The service is free to students, faculty and staff with University ID. Call the University's Student Services office for the schedule and routes (410-706-7117).

Public transportation makes the campus accessible by bus, subway and light rail. A number of Mass Transit Authority bus routes serve the campus. For more information, call the MTA at 410-539-5000. The Baltimore Metro Subway runs between Charles Center and Owings Mills. The trip takes about 25 minutes. Stops closest to campus are at Lexington Market and Charles Center. For more information, call the MTA number above. The Light Rail line runs from northern Baltimore County to points south of the city including Glen Burnie and BWI Airport. The University stop is three blocks east of campus, at Baltimore and Howard Streets. The Maryland commuter train service (MARC) runs from Camden Station, 301 West Camden Street, at Howard St. For information, call 800-325-7245. Amtrak trains run from Penn Station, 1500 N. Charles Street at Mt. Royal Avenue. For information, call 800-523-8720.

LIVING IN BALTIMORE

Baltimore is a fun, friendly city with many affordable and convenient housing options. The brochure *University Housing Options*, which describes on- and off-campus student housing, is available from the Housing Office in room 122 of the student union, or by calling 410-706-7766.

On-campus housing includes two University complexes—the Baltimore Student Union and Pascault Row Apartments—featuring apartments and dormitory style rooms as well as unfurnished apartments in a half-dozen privately owned loft-district buildings around the campus.

Many students choose to live in neighborhoods near the campus. A wide range of rooms, apartments and home rentals are also available throughout the Baltimore metropolitan area. For more information about available rooms and apartments, stop by the Housing Office, call 410-706-8087 or visit www/UMB-Apartment-Guide.com.

THE CITY OF BALTIMORE

In addition to professional opportunities, Baltimore offers a stimulating environment in which to live and study. Several blocks from the campus is the nationally acclaimed Inner Harbor area, where Harbor place, the National Aquarium, the

Maryland Science Center and other facilities share an attractive waterfront with sailboats, hotels, restaurants and townhouses. The Baltimore Metro, Light Rail, and buses link downtown with the suburbs.

Baltimore boasts lively entertainment, world-class museums, fine music and professional theaters. For sports fans, Baltimore features Orioles baseball with Camden Yards stadium being only two blocks from campus, Ravens football, whose stadium is next to Camden Yards, and the Baltimore Thunder league-winning lacrosse. The nearby Chesapeake Bay offers unparalleled water sports and the seafood for which the region is famous.

CLOSE TO WASHINGTON, DC

The campus is located 50 miles from the nation's capital—home to many professional organizations, including the American Association of Colleges of Pharmacy and the American Pharmaceutical Association. The School's proximity to the District of Columbia offers numerous opportunities for students and faculty to participate in health-care policy and research programs or activities. Many students complete their experiential rotations with these organizations. An economic, political and cultural center, Washington also affords researchers access to some of the world's best libraries, including the Library of Congress and the National Library of Medicine.

Washington also offers countless sightseeing opportunities. Visitors to the city of monuments, memorials and museums frequent such historic landmarks as the Capitol, the White House and Ford's Theater, or explore the Smithsonian's museums or the National Zoo. Washington is also served by an excellent public transportation system.

The School of Pharmacy

THE SCHOOL AND ITS HISTORY

The University of Maryland School of Pharmacy has a rich and distinguished heritage. First incorporated as the Maryland College of Pharmacy on January 27, 1841, it is the oldest pharmacy school in the South and the fourth oldest in the country. Primarily an independent institution until 1904, the Maryland College of Pharmacy then became the department of pharmacy of the University of Maryland. In 1920, the University of Maryland in Baltimore merged with the Maryland State College at College Park to form the state University. Today, the School is one of the seven professional schools of the University of Maryland.

Throughout its history, the School of Pharmacy has been a local and national leader in the profession of pharmacy. It was a founding member of the American Association of Colleges of Pharmacy, the professional organization established to formulate uniform standards for the graduation of pharmacy students. The School was also instrumental in the formation of the American Council for Pharmaceutical Education, the national accreditation organization for schools of pharmacy.

In 1970, through the efforts of the School and the Maryland Board of Pharmacy, Maryland became the first state to replace unstructured internships with a professional experience program incorporated in the School's curriculum, setting a national standard for professional pharmacy education. In 1980, Maryland became the first School of Pharmacy to establish a Center for the Study of Pharmacy and Therapeutics for the Elderly, now the national model for pharmacy geriatric education. In 1993, Maryland again set a new benchmark for the nation by implementing a pace-setting Doctor of Pharmacy (PharmD) program.

COMMITMENT TO DIVERSITY

The School strives to achieve racial, sexual and ethnic diversity in its enrollment. To achieve this objective every consideration is given to minority student applicants. The 1999 enrollment statistics reflect the diversity of the student population: 49% Caucasian, 27% Asian, 15% African-American, 6% International, 2% Hispanic and 1% Native American.

COMPLIANCE WITH ADA LEGISLATION

In accordance with the Americans with Disabilities Act of 1990, the School examines all aspects of its programs and services to ensure accessibility to qualified students with disabilities. From recruitment to commencement, the School

strives to create an environment that respects individual differences while challenging students to perform to their optimal ability. Modifications tailored to the needs of the diverse student population include applications, brochures, course materials and examinations offered in alternate formats and modifying the length of time to complete degree requirements. Equally important, the administration reviews organizational activities that would prohibit participation by students with disabilities and provides services for these students to ensure their rights and protection under the law. With increased use of computer technology, the School makes information more accessible and is better able to serve students with disabilities.

FACILITIES

The School moved to Pharmacy Hall, a seven-story facility on Pine Street, in 1982. Situated at the west entrance to the campus, Pharmacy Hall houses classrooms and lecture facilities, research laboratories, conference rooms and administrative offices for the School of Pharmacy. Pharmacy Hall also houses a GMP (Good Manufacturing Practices) facility capable of producing drugs for human consumption. The Pharmacy Learning Center opened in 1999 and houses teaching laboratories, a lecture hall, classrooms, seminar rooms, a student lounge, a web-based instructional development facility and faculty offices. The building is wired for Internet access. Projection systems enable presenters to make Power Point presentations and utilize Web sites in their lectures.

Some members of the Pharmacy Practice and Science Department are located two blocks away in the five-story Allied Health Building, which opened in 1992. Located at 100 Penn Street, it is located diagonally across from the Maryland Pharmacists Association offices in the Kelly Building at 650 West Lombard Street. School staff and faculty are also located in the Century Building, at 506 West Fayette Street, the Greene Street Building (100 N. Greene St.), and the University of Maryland Biotechnology Institute on Lombard Street.

COMMUNITY AND PROFESSIONAL SERVICE AND RESEARCH SUPPORT PROGRAMS

In addition to its degree programs, the School offers several community service and research support programs. The School's **Academic Computing Laboratory** is located on the third floor of Pharmacy Hall. It has 18 computers for professional student and general use, as well as a laser printer. The School has 303 computers—271 IBMs and 32 Macintosh—and 215 printers, including 60 laser printers and one color laser. These computers are linked to a Local Area Network (LAN) to share files, software and to use electronic mail. Additional computers are located in the Swain Pharmacy Practice Laboratory, equipped with state of the art computers and pharmacy software for educational use.

The **Biomedical Chemistry NMR Center** houses a G.E. 300 MHz nuclear magnetic resonance spectrometer. The superconducting magnet, the heart of the instrument, is permanently immersed in a vacuum-jacket reservoir of liquid helium (-260°C) and allows the detection and accurate determination of protons, ^{13}C , ^{31}P and other nuclei of biological importance. The NMR was the first instrument of its kind on campus that opened up many new avenues of research within the School, greatly increasing the number of inter-school collaborative ventures.

The **Center on Drugs and Public Policy** contributes to informed debate of drug policy issues in our society. In addition to conducting research on major drug policy issues, the center organizes conferences and workshops and serves as a consultant on drug issues to organizations in the private and public sectors. Fellowships or externships are available to professionals from industry, state and local agencies, foreign governments, or universities who want a campus-based experience in drug-related policy research as well as an orientation to relevant agencies and organizations based in the Baltimore-Washington area.

The **Peter Lamy Center on Drug Therapy and Aging** serves as the focal point of all of the School's geriatric education, service and research activities. It provides continuing education programs on both the state and national levels. Federal and private funding supports the center's efforts to foster relevant research by faculty and graduate students from all School departments. The Center administers the Elder-Health Program, which informs pharmacy students and retired pharmacists about the social and psychological aspects of drug use among the elderly, as well as the therapeutic goals of treatment for prescribed and over-the-counter medications. The students and retirees then take this knowledge and provide presentations to elderly members of the community.

The **Computational Chemistry Laboratory** is where mathematical models are applied to the study of biochemical systems. The goal of these studies is to better understand the relationship between the three-dimensional structure and dynamics of biological molecules and their physiological function. Such knowledge allows for detailed analysis of the molecular basis of disease, a rational basis for the design of therapeutic agents. These approaches greatly increase the efficiency of the drug discovery process and can lead to significant savings of both time and money, of which may ultimately be passed on to the consumer.

The **Mass Spectrometry Laboratory** houses equipment used to determine the structure of unknown chemicals and provide quantitative measurements of drugs and chemicals from a variety of sample sources. The laboratory's focus is on both basic and applied research, increasing analytical services on the University of Maryland campus and supporting expanded mass spectrometry-related research activities in the larger scientific community.

The **Maryland Poison Center** serves as the regional poison center for the state of Maryland. As an emergency telephone service, it provides 24-hour toxicity and treatment information to the general public and to health professionals. Staffed by pharmacists and registered nurses, the center handles over 54,000 poison-related calls each year. It is certified by the American Association of Poison Control Centers as a regional poison center. University of Maryland health professional

students work within the center. It serves as an educational site for both pharmacy students and medical residents.

The **Mental Health Program** of the School of Pharmacy is a joint venture with the Developmental Disabilities Administration and Mental Hygiene Administration of the state of Maryland. Its primary goal is to upgrade all aspects of pharmacy practice within the state's mental health facilities. The program also serves as a site for pharmacologic and administrative research in mental health, a testing ground for the development of innovative strategies in mental health pharmacy practice and a training resource for mental-health-related issues. Members of the School's faculty serve at nine mental health sites around the state.

The **Office of Substance Abuse Studies** conducts research and community service in the field of substance abuse and dependence. OSAS is also responsible for the School's drug and alcohol abuse programs, including administration of the Student Committee on Drug Abuse Education (SCODAE), operation of a drug-abuse information telephone service and publication of the quarterly newsletter *PharmAlert*. SCODAE is a volunteer organization of pharmacy students who, with faculty support and guidance, are committed to the development of rational attitudes about drugs by serving as a source for accurate, unbiased drug information. SCODAE students present drug education lectures to a variety of groups from elementary school children to health-care providers.

University Pharmaceuticals of Maryland, Inc., a for-profit corporation, is a subsidiary of the Pharmaceutical Education Development Corporation, a not-for-profit foundation created by the School of Pharmacy. UPM is a contract resource organization that offers a modern GMP facility and an analytical/bio-analytical laboratory for dosage form design and evaluation. UPM offers a broad range of services in the drug development and approval process: preformulation and formulation development, excipient testing, process optimization and feasibility studies. UPM's staff provides consultant services in dosage form design (solid, liquid, semi-solid, inhalation), regulatory affairs (NDA, INDA, and ANDA) and analytical development (assay, dissolution, bio-assay). UPM's Education division provides outcome-based staff development programs and educational experiences for pharmacists and pharmaceutical scientists in industry, government and other universities.

STUDENT GOVERNMENT

The School's Student Government Association coordinates all student government activities. Through its officers and committees, the SGA sponsors numerous social, service and educational events. All professional pharmacy students belong to the SGA. The executive committee of SGA includes the presidents of all of the School's organizations. The committee meets periodically with School administrators to discuss issues affecting students. At the University level, the University Student Government Association coordinates the student government activities of the seven professional schools. USGA representatives are elected by the students of all seven schools.

LECTURE SERIES

The School supplements its regular curriculum with the following special lectures and symposia:

Francis S. Balassone Memorial Lecture. The Maryland Pharmacists Association, the School of Pharmacy Alumni Association and the School sponsor this lectureship as a memorial to Francis S. Balassone. A 1940 graduate of the School, he was president of the Alumni Association, a distinguished former faculty member and a past president of the National Association of Boards of Pharmacy.

Andrew G. DuMez Memorial Lecture. This lectureship was established in 1969 by Mrs. DuMez in memory of her husband, Dr. Andrew G. DuMez, dean of the School of Pharmacy from 1926 to 1948, Dr. DuMez was a distinguished educator and leader in pharmacy in Maryland, the United States, and internationally.

Ellis Grollman Lecture in Pharmaceutical Sciences. Mrs. Evelyn Grollman Glick funded a lecture program in memory of her brother, Ellis Grollman, in 1983. Dr. Grollman was a 1926 graduate of the School. Each year a nationally recognized researcher in the pharmaceutical or related basic sciences is invited to present this lecture.

Peter P. Lamy Lecture. The Peter P. Lamy Lecture was inaugurated in 1992 in recognition of Dr. Lamy's career as an international authority on geriatrics and gerontology. This lecture provides an opportunity for pharmacists to discuss critical issues in the care of the nation's elderly.

Dean's Colloquium. The Dean's Colloquium brings together students, faculty, and nationally recognized scientists and clinicians to discuss contemporary issues of relevance to pharmacy and health care. These seminars provide unique opportunities for interaction and exchange of new information on topics related to pharmacy practice and science.

ENDOWED CHAIRS

The **Emerson Professorship in Pharmacology** was endowed in 1927 as a chair in Biological Testing and Assay by Captain Isaac Emerson, president of the Emerson Drug Company. The first chair was filled by Dr. Marvin Thompson, a pharmacologist at the Food and Drug Administration at the time. Dr. Clifford W. Chapman, a pharmacologist from the Canadian National Laboratories was appointed to the chair in 1938. Dr. Casimer Ichniowski and Dr. Naim Khazan were the third and fourth appointees to the chair. In 1988, Dr. Gerald M. Rosen was appointed Emerson Professor, which in turn led to Dr. Rosen's being named an Eminent Scholar by the Maryland Higher Education Commission.

The **Parke-Davis Chair in Geriatric Pharmacotherapy** was established in 1990 with a \$1 million gift from the Warner-Lambert Company on the eve of the 125th Anniversary of Parke-Davis and the School of Pharmacy's 150th Anniversary. The endowment will underwrite the School's continuing commitment to geriatric pharmacotherapy as exemplified by the accomplishments of the

late Peter P. Lamy, the first holder of the Parke-Davis Chair. Dr. Bruce C. Stuart is current holder of this chair.

OFFICE OF EXTERNAL AFFAIRS

The Office of External Affairs works directly with the dean, Board of Visitors, alumni, friends, supporters and current students in advancing the School of Pharmacy. Funding programs, activities, scholarships and capital projects are all priorities of the office. Initiatives such as the Annual Fund and the *Invest in Excellence Campaign* (the School of Pharmacy's \$6 million capital campaign) are two development initiatives that are carrying the School into the next century.

Within the division of External Affairs, the Office of Alumni Affairs/Public Relations supports the goals of External Affairs and those of all other departments through media relations, advertising, promotion and publishing the School's semi-annual magazine, *News Capsule*. For more information about the Office of External Affairs, visit rx2.umaryland.edu/Alumni/.

ALUMNI ASSOCIATION

The mission of the School of Pharmacy Alumni Association is to strengthen and enhance the School by fostering communications, social interactions and a sense of pride in the School. Each year the association sponsors a spring banquet honoring the graduating class and the 50-year class. The Alumni Association also awards eight need-based scholarships to deserving students and plays a leadership role in the School's fund-raising activities. Many members participate in the annual phone-a-thon and are generous donors to the David Stewart Associates, the major giving club for alumni, friends and faculty who contribute \$1,000 or more annually to the School.



Madeline Feinberg, PharmD, counsels a patient.

Doctor of Pharmacy (PharmD) Program

DESCRIPTION

The four-year Doctor of Pharmacy program is divided into six levels: Fundamentals, Basic Science, Pharmaceutical Science, Integrated Sciences and Therapeutics, Experiential Learning, and a Curriculum-Practice Interface. The academic focus of each level is described below:

LEVEL I: FUNDAMENTALS

Students entering the PharmD program have diverse educational and life experiences. Level I addresses these diversities with introductory courses covering the concept and scope of pharmaceutical care, pharmacy practice in general, the variety of disciplines that will contribute to pharmaceutical education, and provides the skills and scientific principles and concepts fundamental to subsequent curricular experiences.

LEVEL II: BASIC SCIENCE

During Level II of the curriculum, students build on the fundamentals of Level I through a comprehensive examination of basic biological, chemical, physical, social and behavioral sciences. These elements provide the foundation for understanding pharmaceutical science and the complexities of drug action and use.

LEVEL III: PHARMACEUTICAL SCIENCE

Level III addresses pharmaceutical science content areas as they relate to the needs of patients in the total health-care environment. The provider of pharmaceutical care must possess a detailed and comprehensive understanding of the physical, chemical, biological and psychosocial factors affecting the outcomes of drug therapy in specific patients with specific diseases.

LEVEL IV: INTEGRATED SCIENCES AND THERAPEUTICS

Level IV addresses the extensive interweaving of basic and clinical science as well as the interrelated bodies of knowledge involved in total pharmaceutical care.

Students build upon their basic and pharmaceutical science background as they actively participate in a variety of didactic and laboratory experiences to design, implement, manage and monitor individualized plans for pharmaceutical care. Students learn to appreciate that the successful outcomes of drug therapies depend on complex physical, chemical, biological and psychosocial interactions within human systems, and that successful outcomes require individualized attention to patients during the design and delivery of pharmaceutical care. This application of integrated science to patients with specific diseases is presented within the broader context of public health, epidemiology, prescriber education, disease prevention and health promotion issues.

Three progressive components are used to present each disease. The first component reviews the drugs and biologicals used to treat specific disease processes and emphasizes comparative features underlying the choice of agent (Pharmacodynamics and Pharmacokinetics). Chemical properties, such as solubility and stability, that determine the choice and use of the products, are discussed (Biomedical Chemistry and Pharmaceutics). The availability and comparative advantages of drug dosage formulations and delivery systems are considered as they relate to the optimum use of drug products during acute or chronic care (Biopharmaceutics).

The second component illustrates how the links between the scientific knowledge of the disease, available drug products and the variables underlying a particular patient's condition are important to developing the most appropriate therapeutic plan. Methods for the choice of drug products, definition of specific goals of therapy, including how to assess whether these goals are being achieved and active intervention steps to ensure successful outcomes of drug therapy, are developed (Therapeutics). Methods for monitoring, identifying and responding to untoward consequences of drug therapy are identified (Toxicology and Adverse Drug Reactions). The choice and design of specific acute and chronic drug therapy, the impact of a variety of patient-related variables on dosage regimens and the modification of dosage regimens in response to changing patient needs, are developed (Clinical Pharmacokinetics). Students develop skills as they practice counseling patients about their therapeutic plans in particular and providing health education in general (Counseling and Education).

The third component links the knowledge base of the first two components with appropriate ongoing methods for drug use review, medical audits and cost considerations. The emphasis is on identifying specific interventions to improve prescribing patterns and reduce the cost of health-care (Drug Use Evaluation).

LEVEL V: EXPERIENTIAL LEARNING

Experiential learning is a series of structured learning and training activities during which students work under the supervision of experienced clinical and academic faculty in a variety of health-care settings. Students obtain and apply knowledge and skills necessary for successful delivery of pharmaceutical care and develop competence, confidence and maturity as responsible professionals. An

Experiential Learning Map



innovative feature of the program is that experiential learning activities occur throughout the curriculum and are linked to didactic courses. A total of 32 credits in experiential courses (approximately 1,600 hours) are required for the degree. All students must complete at least 24 credits (1,100 hours) of experience devoted to pharmaceutical patient care. *Successful completion of the experiential learning portion of the Schools curriculum is accepted by the Maryland Board of Pharmacy as meeting the internship requirements to sit for the NAPLEX licensure examination.*

The Experiential Learning portion of the PharmD curriculum is organized into six phases:

Phase 1: Introduction to Professional Pharmacy Practice. This early practice experience introduces students to the professional responsibilities of pharmacists in a variety of practice environments, including community, hospital and spe-

cialty settings. Students will also examine the spectrum of career opportunities available to today's pharmacist and begin developing basic practice skills.

Phase 2: Longitudinal Pharmaceutical Care. During the second and third years of the curriculum, students observe and participate in the delivery of pharmaceutical care to patients. Students follow the changing needs of a patient for two years within the context of the total health-care system. Through direct patient encounters and discussion sessions, students learn to assess health status, communicate effectively and determine pharmaceutical care needs from a holistic perspective. These activities are linked to the material covered in the didactic curriculum, specifically applying the patient assessment skills taught as part of the Human Biology (Anatomy, Physiology, Pathophysiology) sequence.

Phase 3: Distributive Services. Activities during this phase develop students' competency and proficiency in the technical functions of drug dispensing and distribution in institutional and community pharmacy settings. Students learn to receive, interpret and verify the appropriateness of prescription orders. Students learn to efficiently dispense a variety of manufactured and compounded medications and to recognize the role of technology and ancillary personnel in the drug distribution process.

Phase 4: Pharmaceutical Care. Students gain experience in the delivery of pharmaceutical care in a variety of practice environments, including community-based and acute-care hospital pharmacies as well as ambulatory primary care and interdisciplinary clinics. Through daily encounters with patients and other health-care providers, students learn to collect patient-specific data, identify and assess drug-related problems, develop monitoring plans and measure therapy outcomes. Further, students learn to educate patients and health-care professionals about the appropriate use of drugs.

Phase 5: Informational Services. Activities during this phase, which occurs simultaneously with Phase 4, require the student to provide drug information in the context of delivering pharmaceutical care. Students learn to receive a question in a comprehensive fashion, thoroughly analyze and research questions and provide appropriate answers to other health-care providers and to patients and their families.

Phase 6: Elective Experiences. Elective rotations allow students to pursue their own areas of interest. Electives in general practice environments enable students to develop greater skill, proficiency and confidence. Electives in specialty pharmacotherapeutic practice areas, alternative forms of advanced practice management and research afford opportunities to explore a variety of practice options. This phase is linked to a senior colloquium.

Student performance during all six phases is evaluated by both clinical and academic faculty. Experiential rotations are **not** permitted at a site where a student is working for pay or where any other conflict of interest situation may exist.

LEVEL VI: CURRICULUM-PRACTICE INTERFACE

The sixth and final level of the curriculum contains a variety of educational experiences for the students about to enter practice. Required and elective content areas provide the curricular-based interface with pharmacy practice that builds on the preceding didactic and experiential components of the curriculum. The *capstone* nature of this interface reflects the acquisition and appreciation of information that:

- is on the cutting edge of pharmacy practice,
- represents closing options for individual curricular pathways or
- helps prepare students for a post-graduate education.

Students learning at the interface are expected to be under continual change and development. One goal of this level is to allow all senior students, following completion of their experiential components, time to consider individual practice in the context of the total health-care environment. An important part of this interface, therefore, will be the opportunity for students to reflect interactively upon their educational experiences with fellow students, faculty and practitioners.

CURRICULUM PATHWAYS AND ELECTIVES

The central curricular theme, primary pharmaceutical care, encompasses the educational experiences common to all students in the program. All students must successfully complete the required core curriculum which prepares them for competent performance of basic pharmaceutical care in a variety of professional and practice settings. To supplement the required core curriculum, students take more than 21 percent (28 credits) of the four-year curriculum from the didactic and experiential electives. This portion of the curriculum provides students with an opportunity for flexible programming of their educational experience. In collaboration with their academic advisors, students use electives to develop a *Plan of Study* that is consistent with their personal interests and career goals. Students' Plans of Study are used to enhance their general practice of pharmaceutical care, to focus on a particular area of practice or to prepare for post-graduate studies.

Students may select freely from elective options to design their Plan of Study or may choose one of several model *pathways* designed to enhance their preparation for common areas of interest. The model pathways generally account for 16 to 18 of the 28 elective credits required for the degree. Therefore, students' selection of a model pathway still provides them considerable flexibility in selection of additional electives. Faculty have developed the following four model pathways:

Advanced Pharmacy Practice

Goal: To prepare students to implement pharmaceutical care in a variety of practice settings. This pathway provides a series of didactic and experiential courses designed to enhance competence in delivering pharmaceutical care in general practice; delivering health-care to special populations such as the elderly; enhancing knowledge of special pharmaceutical products, business and managerial skills

needed to successfully deliver new services, and providing experience in applying these professional and managerial skills in a variety of advanced practice settings.

Pharmacotherapy

Goal: To enhance students' ability to independently optimize, implement and monitor drug therapy in patients with complex health problems. This pathway offers a series of didactic seminar courses in pharmacotherapy and advanced therapeutics, coupled with advanced clinical experiences. The clinical experiences involve direct drug therapy management of patients in general medical and sub-specialty environments. Students completing this pathway are encouraged to pursue post-PharmD training in residencies and fellowships and to eventually pursue specialty board certification in pharmacotherapy.

Management

Goal: To prepare students for management careers in corporate pharmacy, to develop entrepreneurial capabilities and to prepare students for post-PharmD management residencies and/or MBA programs. Students take a series of didactic and experiential courses in personal management, practice management, organizational behavior, financial reporting and analysis, marketing, and experiences working with managers in health-care settings.

Research

Goal: To expose students to research and better prepare them for graduate studies or post-graduate fellowships. Students selecting this pathway take courses in advanced educational opportunities, advanced seminar courses in selected scientific areas, research experiences working directly with faculty scientists and a senior colloquium.

Faculty pathway coordinators, who design and maintain the integrity of the pathways and faculty advisors with expertise in each pathway area, serve as consultants to students for information on career opportunities resulting from a particular pathway. Students have freedom of choice in selecting a pathway. Students not choosing to take all courses in a specific pathway, can select elective courses from multiple pathways as part of their personal Plan of Study provided they complete the appropriate prerequisites.

COMBINED PHARMD/MBA PROGRAM

The School offers a combined PharmD/MBA program with the University of Baltimore Merrick School of Business for students who wish to pursue the Master's in Business Administration degree. The combined program allows pharmacy students to take MBA courses as part of their professional curriculum. While in pharmacy school, PharmD students may complete 21 of the 51 credit-hours required in the MBA program. PharmD students must apply to the MBA program; admission is not guaranteed.

Students wishing to apply to the MBA program must adhere to UB procedures and deadlines. Students must also request that the University of Maryland's Office of Records and Registration send their official University of Maryland transcript and that the School of Pharmacy Office of Student Affairs send a copy of their prepharmacy transcripts to UB. Students applying to this combined program need the equivalent of a bachelor's degree (i.e., either a degree or completion of four years of college). The grade point average for an entering MBA student is 3.0; however, a lower GPA may be offset by a higher score on a standardized test (e.g., GMAT, PCAT).

COMBINED PHARM D/PH D PROGRAM

The School offers a combined PharmD/PhD program to prepare comprehensively trained individuals with an interdisciplinary perspective on teaching and scientific research. The program will function as a cooperative effort between the PharmD curriculum and the graduate curricula of the departments of Pharmaceutical Sciences and Pharmacy Practice and Science. The PharmD and PhD phases of the program will run concurrently with minimal disruption of the academic content or sequencing of the PharmD component. This will permit combined degree students to progress normally in the PharmD program and graduate with their class. To achieve this goal, students may take open vacation periods as well as Research Pathway electives and other elective options within the PharmD program and apply them toward the requirements of the PhD component. Students already in the PharmD program may be considered for admission to the combined degree program. The greatest potential benefits are for students who enter the combined program at an early stage. Combined degree students can expect to complete their core graduate coursework and be ready for advancement to candidacy for the PhD degree by the time they complete the PharmD program. Students may complete the requirements for the award of both the PharmD and PhD degrees in seven years.

Consideration for admission to the combined program is contingent upon satisfying the admission requirements of the University of Maryland Graduate School. A bachelor's degree is generally required for admission to the graduate program. Notwithstanding any measures used in determining admission to the PharmD program, the criteria for evaluation of applications to the PharmD/PhD program will include: the quality of the applicant's academic record, standardized test scores (GRE and PCAT), letters of recommendation, interviews held with students, and compatibility between the students' career goals and the objectives of the combined program. The current minimum requirements for admission include an acceptable baccalaureate degree with a GPA of 3.0 or better, GRE scores of 1600 or better, and, where applicable, TOEFL scores of at least 600.

Summary of Doctor of Pharmacy Program

COURSEWORK

MINIMUM SEMESTER CREDITS

Didactic	100 credits
80 Required	
20 Elective	
Experiential	32 credits
24 Required	
8 Elective	
Total	132 credits

COURSEWORK BY SEMESTER

The following outline is one suggested Plan of Study for electives. Electives can be taken during most fall, winter, spring and summer semesters.

SEMESTER ONE

CREDITS

PHAR 511: Biochemistry I	2
PHAR 512: Cell Biology	2
PHAR 513: Drug Chemistry	2
PHAR 514: Human Biology I	3
PHAR 515: Personal Management	1
PHAR 516: Pharmacy Practice and Education	3
PHAR 517: Study Design and Analysis	2
TOTAL	15

SEMESTER TWO

PHAR 521: Biochemistry II	3
PHAR 522: Context of Health Care	3
PHAR 523: Ethics in Pharmacy Practice	1
PHAR 524: Human Biology II	3
PHAR 525: Immunology	2
PHAR 526: Physical Chemistry	2
PHPC 527: Introduction to Professional Practice	1
DIDACTIC ELECTIVES	2
TOTAL	17

SEMESTER THREE

PHAR 530: Microbiology/Antibiotics I	3
PHAR 531: Pharmaceutical Chemistry	2
PHAR 534: Human Biology III	3
PHAR 536: Pharmacology I	2
PHAR 537: Principles of Drug Action	2
PHAR 541: Biopharmaceutics and Pharmacokinetics	3
DIDACTIC ELECTIVES	2
TOTAL	17

SEMESTER FOUR

PHAR 540: Microbiology/Antibiotics II	1
PHAR 542: Clinical Chemistry	1
PHAR 544: Medicinal Chemistry	3
PHAR 545: Practice Management	3
PHAR 546: Pharmacology II	3
PHAR 535: Pharmaceutics	3
PHPC 532: Longitudinal Pharmaceutical Care I	1
DIDACTIC ELECTIVES	2
TOTAL	17

SEMESTER FIVE

PHAR 552: Principles of Human Nutrition	1
PHAR 553: Population Based Medical Info. Analysis	2
PHAR 554: Integrated Science/Therapeutics I	4
PHAR 555: Integrated Science/Therapeutics II	4
DIDACTIC ELECTIVES	4
TOTAL	15

SEMESTER SIX:

PHAR 564: Integrated Science/Therapeutics III	4
PHAR 565: Integrated Science/Therapeutics IV	4
PHPC 562: Longitudinal Pharmaceutical Care II	1
DIDACTIC ELECTIVES	6
TOTAL	15

SEMESTER SEVEN:

PHPC 570: Community Distributive Services	3
PHPC 571: Hospital Distributive Services	3
PHPC 572: Pharmaceutical Care I	3
PHPC 573: Pharmaceutical Care II	3
TOTAL	12

SEMESTER EIGHT:

PHAR 580: Pharmacy Law	2
PHAR 581: Senior Colloquium	1
PHPC 574: Pharmaceutical Care III	3
PHPC 575: Pharmaceutical Care IV	3
PHPC 576: Ambulatory Clinic ¹	1
PHPC 577: Informational Services ¹	2
EXPERIENTIAL ELECTIVES ²	8
DIDACTIC ELECTIVE COURSES	4
TOTAL	24

GRAND TOTAL**132 minimum credits**

¹Taken concurrently with Pharmaceutical Care Rotations

²Students complete experiential rotations at various times during year, but register for the rotations in the semesters listed.

Nontraditional Pathway

DESCRIPTION

The Nontraditional PharmD Pathway is a mechanism for licensed BS pharmacists to earn the Doctor of Pharmacy degree. All graduates will be required to meet the **terminal performance outcomes** of the School's PharmD program. Satisfying these terminal objectives takes at least 30 credits of coursework. Since each non-traditional student brings to the program a different level of practical experience, knowledge and skill developed throughout a practice career, a system of Prior Learning Assessment (PLA) has been developed to individualize a program of study and award credit(s) (0-10) when appropriate. It should be noted that the awarding of credit through PLA does not exempt a participant from responsibility for any of the process or knowledge-based outcomes of the program.

Experiential learning will be centered in the pharmacist's own practice site, under the supervision of a faculty mentor, and utilizing the pharmacist's own patients. Some clerkship experience is required at other sites. The mentor will also work closely with each pharmacist to identify an appropriate mix of patients and to develop an appropriate experience component that will meet individual needs and satisfy pathway requirements.

Credits in the NTPD may be earned by taking courses from a faculty-approved menu, through supervised experiential learning, by approved self-study with appropriate assessment and/or through PLA. The foundation of the NTPD is established in the core courses: i.e., the philosophy of the program is developed and the concepts, procedures and skills of pharmaceutical care delivery are defined and demonstrated.

Required courses in the pathway include an in-depth treatment of therapeutics for prevalent diseases, so that the pharmacists are prepared to provide pharmaceutical care services. Candidates will demonstrate the ability to manage a practice fiscally and behaviorally, to measure value of service(s) and establish fees and reimbursement policies and to market and promote pharmaceutical care services.

Courses are offered at the University of Maryland campus in downtown Baltimore, and selected courses may be offered through distance education facilities throughout the state as well as other University System of Maryland campuses. Classes are planned for the fall, spring and summer semesters; however, first year students will always begin in the fall semester.

In the experiential learning component of the pathway, students will develop a representative patient population in their practice site to be followed during the program and in the performance-based evaluation in the final clerkship. Beginning with the initial patient identified as a study case, students will learn to triage, develop explicit pharmaceutical care plans and initiate the patient management process. As they proceed, a longitudinal process will be used to monitor and assess their progress in practice.

A faculty mentor assigned to each student will meet regularly with the student to assess progress and provide continuous feedback. Since implementation of a new service should be cost-effective, students are required to develop a resource assessment (e.g., personnel needs, space, equipment), propose a structure for compensation, and provide a marketing plan for the practice site.

PROGRAM REQUIREMENTS

In addition to coursework, the credit requirements of the NTPD may be partially met through the following three options:

TRANSFER

Nontraditional students may transfer up to six credit-hours of previous coursework to meet the pathway requirements. This coursework must have been completed after the pharmacists received their BS degrees, must have been earned at an accredited university, and must relate directly to curricular components of the NTPD. Potential transfer courses are identified when a candidate is being evaluated for admission, or later if appropriate, through consultation between the student and the pathway Director. (Note: It is not possible to obtain additional PLA credit for transfer courses.)

PRIOR LEARNING ASSESSMENT (PLA)

Through the Prior Learning Assessment process, students may earn credit for the knowledge and experience they bring to the program. To be eligible for PLA credit, students must complete the course PLA in Pharmacy Practice, have the PLA panel evaluate their portfolio and have the faculty approve a credit recommendation from the panel. The PLA panel is comprised of school faculty and pharmacy practitioners. Students may earn a maximum of 10 credits in four areas: Practice Management Planning (0-1), Community/Institutional Pharmaceutical Care (0-1), Pharmacotherapeutics (0-4) and Practice Management (0-4). These four areas correspond directly to curriculum components. The panel has developed assessment instruments for each of these areas.

CREDIT BY EXAMINATION

The University permits a credit by examination process for a course. Information test-out options is provided by each coursemaster. Students who successfully complete the *entire* course by examination may register for Credit by Examination in the specific area. Students pay a per-course fee, based on residency status. Upon approval by the coursemaster, students who successfully complete a

discrete section of the examination may not be required to attend all class sessions and/or modules. In this case, students must still register for the course, and the results of the examination will be factored into the grade determination. For more information, call 410-706-0761.

EXPERIENTIAL LEARNING

Starting early in the required courses, students will develop a representative patient population in their practice site to be followed during the program and in the performance-based evaluation in the final clerkship. Beginning with the initial patient identified as a study case, students will learn to triage, develop explicit pharmaceutical care plans, and initiate the patient management process. As they proceed, a longitudinal process will be used to monitor and assess their progress in practice.

Typically each student's faculty mentor will periodically assess the student's progress and provide continuous feedback. Some on-site observations will be conducted by the faculty mentor or his/her assignee. Since implementation of a new service should be cost-effective, students will develop a resource assessment (e.g., personnel needs, space, equipment), propose a structure for compensation and provide a marketing plan for the practice site.

While the central philosophy of the experiential learning program is to provide for an impact on patients in the pharmacist's own practice, it is anticipated that it will not always be possible to completely meet experiential learning objectives at that site. When it is necessary for exposure to the delivery of pharmaceutical care services at other practice sites, every effort will be made to schedule these visitations at times convenient for the student.



Erich Wagner and Kim Mecler study together in the student lounge.

Application and Admissions Information

APPLICATION PROCEDURES

Applicants must follow the procedure below to apply to the PharmD, Nontraditional Pathway, or either of the School's graduate programs. Application forms are typically available in August for the following academic year. E-mail questions to *PharmDhelp@rx.umaryland.edu*.

PHARMD PROGRAM

- Request an application and admissions information from *www.pharmacy.umaryland.edu*, call 410-706-7653/800-852-2988, or write:
Office of Admissions
University of Maryland
School of Pharmacy
20 N. Pine St.
Baltimore, MD 21201-1180
- Submit a completed application by the deadline:
February 1 Application
March 1 Transcripts and PCAT scores
- Submit the required nonrefundable application fee. Make check payable to: **University of Maryland.**
- Take the Pharmacy College Admission Test in October or January and forward the scores to the School. Applicants can get a PCAT application at the phone number or address above.
- Submit official transcript(s) from all institutions attended. Prepharmacy coursework must be completed before the start of classes in the fall semester of application with a grade of C or better.
- Have a minimum GPA of 2.5.

NONTRADITIONAL PHARMD PATHWAY

To be considered for admission to the Nontraditional Pathway, BS pharmacists, including pharmacists who graduated from international institutions, must complete the application and admission requirements listed below. Once phar-

macists have demonstrated that they meet those criteria, they will be considered for admission. A description of required documentation and other elements of the admissions process will be provided in the application packet. Because of the highly interactive nature of the pathway, the School cannot accommodate more than 60 new students each year.

The admissions procedure is as follows:

- Request an application from *www.pharmacy.umaryland.edu*, call 410-706-0761 or write:
University of Maryland
School of Pharmacy
Nontraditional Pathway
20 N. Pine St.
Baltimore, MD 21201-1180
- Submit a completed application by the deadline:
February 1 Application
March 1 All supporting documents
- Submit the required nonrefundable application fee. Make check payable to: **University of Maryland.**

To be eligible to apply, applicants:

- Must be licensed in Maryland, the District of Columbia, or an adjacent state.
- Must practice in Maryland, the District of Columbia or areas of surrounding states (in order to have access to the pathway's mentoring system).
- Must provide confirmation of access to patients to meet pathway requirements.

GRADUATE PROGRAMS

Applicants seeking master's or doctoral degrees in pharmaceutical sciences or pharmacy administration must apply to the School's Graduate School departments. Interested applicants need to review the University of Maryland Graduate School catalog, which presents the information about the MS and PhD programs. For information about the graduate program of your choice, write to either of the following departments:

Pharmaceutical Sciences Graduate Program
University of Maryland
School of Pharmacy
20 N. Pine St., 4th Floor
Baltimore, MD 21201-1180

Pharmacy Administration Graduate Program
University of Maryland
School of Pharmacy
100 N. Greene St., 6th Floor
Baltimore, MD 21201-1180

ADMISSIONS PROCEDURES FOR THE PHARMD PROGRAM

Applicants for the Nontraditional Pathway please refer to page 27.

An admissions committee comprised of faculty, alumni and students reviews official transcripts and PCAT results to make admissions decisions. Applicants with strong academic credentials and PCAT scores are invited to interview with faculty, alumni and students. During the interview, the applicant is assessed on factors such as professional and social awareness, verbal and written communication skills, integrity, maturity and motivation. Following the interview, the admissions committee makes a decision based on applicants' academic achievement, PCAT scores and qualities evaluated during the interview. Academic achievement and/or high PCAT scores do not, in themselves, ensure acceptance.

While a minimum GPA of 2.5 (A=4.0) is required for admissions consideration, the average entering GPA of the fall 1999 first year PharmD students was 3.5. Average PCAT scores of admitted students were above the 80th percentile in each of the five areas of the exam. Competition for admission is high, and applicants with GPAs below 2.9 have an extremely low probability of admission.

Applicants must present evidence (via official transcripts) of having completed the prepharmacy coursework with grades of C or better.

PREPHARMACY COURSEWORK

Applicants must complete a minimum of 63 semester hours of coursework of pharmacy prerequisites for admission into the PharmD program. At least one semester of this coursework must be taken at an accredited institution in the United States. To enroll in **prepharmacy** coursework, applicants must apply directly to an accredited college or University, **not** to the School of Pharmacy. Most institutions have designated prepharmacy programs and advisors. *The School of Pharmacy does not provide any specific information regarding course content and/or requirements for admission into these prepharmacy programs.* Prerequisites for admission into the PharmD program are as follows:

COURSE	TYPICAL # OF SEMESTERS	TYPICAL # OF CREDIT-HOURS
English (Comp/Lit)	2	6
Calculus	1	4
Statistics	1	3
Biology	1	4
Microbiology	1	4
General Chemistry	2	8
Organic Chemistry	2	8
Physics	2	8
Humanities/Social Sci.	6	18
TOTAL		63 minimum

INTERNATIONAL STUDENTS

Students who are not citizens or permanent residents of the United States must submit the results of the TOEFL, certified official copies of transcripts, a statement of financial support, a supplementary information sheet and a summary of educational experiences. These must be submitted with the application and the application fee to the Office of Records and Registration. International students are also required to take the PCAT. Therefore, it is essential that international students start the admissions process early.

The School does not accept applicants who have attended **only** a foreign educational institution. The School, due to its small size, cannot adequately certify international credentials and relies on the evaluation performed by other institutions. In addition, experience shows that international students benefit from taking courses at other U.S. institutions before entering the PharmD program. International students should be familiar with the rules and regulations of the Immigration and Naturalization Service, which grants admission to the United States.

INTERNATIONAL PHARMACISTS

Individuals who have received their pharmacy degrees from non-U.S. institutions have two options to become licensed pharmacists in the United States. They can take the Foreign Pharmacy Graduate Equivalency Examination, which certifies the applicant for the Board examination. Those who pass this examination, and meet the other requirements of the State in which they wish to practice, are eligible to take the national licensing exam. Individuals taking this approach would not need to attend the School of Pharmacy. For more information, write or call the National Association of Boards of Pharmacy Foundation, Foreign Pharmacy Graduate Examination Committee, 700 Busse Highway, Park Ridge, IL 60068; 847-698-6227.

International pharmacists are also eligible to apply to the School's PharmD program and then upon graduation become eligible to complete state licensure

exams. Credit may be given for equivalent coursework previously completed with a grade of C or better. Credit may be awarded after an evaluation of the course and an assessment of student knowledge by the coursemaster. Based on the structure of the curriculum, international pharmacists typically enter the first or second professional year of the four-year PharmD program. Admission is based on an evaluation of applicant credentials by the admissions committee. International pharmacists are encouraged to take the PCAT exam to assess background knowledge.

LICENSURE REQUIREMENTS

Completion of the PharmD degree satisfies the educational requirement for all state boards of pharmacy in the United States. Graduates are eligible to take state licensing exams in all states. For more information about licensure as a pharmacist in Maryland, graduates may contact:

Maryland Board of Pharmacy
4201 Patterson Ave.
Baltimore, MD 21215-2299
410-764-4755



Dr. Stuart Haines interviews a patient in an ambulatory care clinic.

Financial Information

TUITION AND FEES

Below are listed the tuition and fees for the 1999-2000 academic year. Non-traditional Pathway students are charged tuition per credit-hour regardless of number of hours taken.

Tuition		<i>Full-time</i>	<i>Part-time</i>	NTPD Per Credit
Full-time (9 or more credits)	Resident	\$ 6,983		
	Nonresident	14,442		
Part-time per credit-hour	Resident		273	273
	Nonresident		491	491

Fees

Student Government Association	15	15	15
Transportation	23	23	23
Student Activities	50	50	50
Supporting Facilities	288	288	288

Other Expenses

Clinical Clerkship (experiential courses)	300	300	300
Application Fee (nonrefundable)	50	50	50
Late Registration Fee	40	40	40
Diploma Fee	45	45	45
Liability Insurance	11	11	11
Disability Insurance	24	24	
Hepatitis B Vaccine (1st year only)	140	140	140
Continuing Education Certification			100
Late Payment of Tuition and Fees	100	100	100

The University reserves the right to make changes in fees and other charges, although every effort is made to keep the cost to the student as low as possible.

HEALTH INSURANCE

University or equivalent health insurance coverage is required of all full-time students. Students will be billed for health insurance unless they provide proof of similar coverage to the Office of Student and Employee Health. If students provide documentation, the cost of the premium is waived. The cost of health insurance varies depending on the type of coverage. For the 1999-2000 academic year, the cost for student-only coverage is \$971; student and spouse, \$2,330; student and child, \$1,844; and student and family, \$2,912.

DETERMINATION OF IN-STATE RESIDENCY

The University's Office of Records and Registration makes an initial determination of residency status for admission and tuition when students apply for admission. The determination made at that time, and any determination made thereafter, shall prevail for each semester until the student changes the status. Students classified as in-state residents are responsible for notifying the Office of Records and Registration in writing, within 15 days of any change in their circumstances which might in any way affect their classification at the University. Students may obtain a copy of the University's policy on in-state residency status from the office listed above.

FINANCIAL AID

Student financial aid programs are centrally administered by the Office of Student Financial Aid. These programs are designed to help students who otherwise would be unable to attend the University. Aid packages for full-time students often include a combination of loans, grants, scholarships and work-study designed to meet students' needs. Most Nontraditional Pathway students do not qualify for financial aid due to their part-time status and relatively secure financial situation. To qualify for aid, students must apply annually and meet certain eligibility requirements. **Students are encouraged to complete their financial aid application by February 15.** Students must complete the required Financial Aid application forms, which are available from:

Student Financial Aid
University of Maryland
Baltimore Student Union
Room 334
621 W. Lombard St.
Baltimore, MD 21201

SCHOOL OF PHARMACY SCHOLARSHIPS

Through the generous gifts of alumni, friends and professional associations, the School provides additional financial aid to its full-time students who are in need of financial support. Students do not apply for these awards. Students who receive most awards are those who can document unmet financial need through the Student Financial Aid process. Some scholarships support students from certain geographical areas. The School has established the following scholarships:

April Adams Memorial Scholarship. The students, faculty and friends of April Adams established this scholarship as a lasting tribute to April, Class of 1999. The scholarship, symbolizing April's dedication and love of pharmacy, will be awarded to deserving students in her name.

Marilyn I. Arkin Scholarship Fund. The family and friends of Marilyn I. Arkin, daughter of Ann and Morris Arkin and a member of the class of 1975, established this scholarship as a memorial in 1988. The scholarship provides support for professional students in the School of Pharmacy.

H.J. (Jack) Custis Jr. Memorial Scholarship Fund. In memory of H.J. (Jack) Custis Jr., Class of 1951, a fund was established to award scholarships on the basis of reasonable need and academic ability to students in the professional program of the School of Pharmacy. Students must be residents of one of the nine Eastern Shore, Maryland counties to be eligible for the Custis Memorial Scholarship.

Isadore M. and Irene R. Fischer Memorial Scholarship Fund. The families of Isadore M. and Irene R. Fischer have provided a scholarship fund to support a professional or graduate student demonstrating academic excellence in the educational programs of the University of Maryland School of Pharmacy.

Charles L. Henry Memorial Scholarship. The Charles L. Henry Memorial Scholarship Fund has been provided for PharmD students in the School of Pharmacy requiring financial assistance.

J. Gilbert Joseph Scholarship. In memory of her brother, J. Gilbert Joseph, a former student of the School of Pharmacy, the late Miss Jeanette Joseph provided a generous bequest to endow scholarships for qualified students who have maintained a superior scholastic average and who are in need of financial assistance.

Frederick William Koenig Memorial Scholarship. In memory of her husband, Frederick William Koenig, a practicing pharmacist for 50 years, the late Mrs. Valeria R. Koenig has endowed a scholarship to be awarded annually to a student selected on the basis of financial need, character and scholarship.

Dr. Dean E. Leavitt Memorial Scholarship Fund. In honor of Dr. Dean E. Leavitt, associate dean for administration and professional services, 1976-1989, the family and the faculty established a fund to support a scholarship covering the final year of pharmacy school for students who have attained a minimum cumulative average of 3.0, who have shown superior aptitude and enthusiasm in the course sequence in management, and who have demonstrated, as Dean Leavitt did, a commitment to the qualities of health and humanitarianism, both personally and professionally.

A.M. Lichtenstein Scholarship. In memory of her husband, A.M. Lichtenstein, distinguished alumnus of the School of Pharmacy class of 1889, the late Mrs. Francina Freese Lichtenstein bequeathed a sum of money to endow an annual scholarship to a resident of Allegany County, Maryland. The recipient of the award is to be selected on the basis of financial need, character and scholarship.

Aaron and Rosalie Paulson Scholarship Fund. Established by Mr. Aaron A. Paulson, class of 1924, and his late wife, Rosalie, this endowed scholarship supports a first professional year student with demonstrated financial need.

Plough Pharmacy Student Scholarships. The Plough Foundation, created by Abe Plough, founder of Plough Inc., and the School of Pharmacy contributed funds to an endowment in support of pharmacy students. Funds are awarded on the basis of financial need, academic achievement, leadership and citizenship.

Joseph Sokol Memorial Scholarship. In memory of Joseph Sokol, Class of 1973, the family and friends established this scholarship to provide support for deserving students who have financial need.

Arthur Schwartz Memorial Scholarship Fund. The family and friends of Arthur Schwartz, BS Pharm 1979, PhD Pharmacy Administration 1987, have established an endowed scholarship fund for a graduate student in Pharmacy Administration to honor his memory.

LOAN FUNDS

Rose Hendler Memorial Fund. L. Manuel Hendler and family have established a loan fund for needy students in memory of Mrs. Rose Hendler.

Louis T. Sabatino Memorial Student Loan Fund. In honor and memory of her late brother, Louis T. Sabatino, Class of 1939, Mrs. Marie Sabatino DeOms has established this fund to provide loans to deserving students.

Benjamin Schoenfeld Memorial Pharmacy Loan Fund. The family of Mr. Benjamin Schoenfeld, Class of 1924, has established a loan fund as a memorial to him. This fund is available to qualified needy students. Loans are made upon the recommendation of the dean.

Burroughs Welcome Emergency Loan Fund. The Burroughs Welcome Company established a fund to provide short-term (two months) loans to students in financial need.

STUDENT VETERANS

New students, including Nontraditional Pathway students, who are eligible for educational benefits through the Veterans Administration should forward a completed *VA Form 22-1995: Request for Change of Program or Place of Training* to the Office of Student Affairs. Veterans who have not used any of their VA educational benefits should forward a completed *VA Form 22-1990: Application for Program of Education or Training* and a copy of *DD 214: Separation Papers* directly to the Office of Student Affairs of the School of Pharmacy.

Academic Information

ACADEMIC SESSIONS

The University of Maryland School of Pharmacy operates on a four-semester calendar. The fall term, four months long, begins the last week of August and runs to the Christmas recess. A three-week winter minimester in January allows students to avail themselves of tutorial services or elective courses. The four-month spring term begins the last week in January and extends to just before Memorial Day. While the School does not offer summer-term courses, students may take approved elective courses at other schools within the University, or at other institutions. Full-time students enrolled for the spring semester do not pay tuition and fees for campus courses they take during the January minimester. Students must pay additional minimester tuition at other University System of Maryland campuses.

REGISTRATION POLICIES

CANCELLATION OF REGISTRATION

Students who register and subsequently decide not to attend the School of Pharmacy *must provide written notice* to the Office of Student Affairs on or before the first day of class. If this office has not received a request for cancellation by 5:00 p.m. on or before the first day of instruction, the University will assume that students plan to attend and that they accept their financial obligation.

CHANGE IN REGISTRATION

Students should obtain and return the completed *Add/Drop Form*, used for all changes in registration, to the School's Office of Student Affairs. Students are not charged for a change in registration. Students may not add a course after the first week of classes or drop a course after eight weeks into the semester. Students will receive the grade of F for courses dropped after the eighth week of classes without approval.

LATE REGISTRATION

Students who fail to complete registration by the specified time for regular registration pay a late registration fee.

WITHDRAWAL FROM THE UNIVERSITY

Students who withdraw from the University before the end of a semester are eligible for a partial refund, depending upon the date of withdrawal. To ensure the refund, students must file withdrawal forms in the School's Office of Student Affairs. Students who fail to complete these forms will receive failing grades in all courses and forfeit their right to any refund.

GRADING SYSTEM

The School of Pharmacy uses the following grading system:

Grade	Interpretation	Point Value
A	Excellent	4
B	Good	3
C	Fair	2
D	Poor but Passing	1
P	Pass	0
F	Failure	0
I	Incomplete	Must be replaced by definite grade within one year
WD	Withdrawal	No grade is assigned

When, for any reason, a student repeats a course, the grade achieved in the repeated course replaces all previous grades in the same course.

SCHOLASTIC HONORS

The School recognizes academic excellence during the fall and spring honor convocations. During the fall ceremony, students receive academic achievement awards in all classes based on performance the preceding year. The School also recognizes leaders of student organizations at this time. The Rho Chi Honor Society presents its annual book award to the student(s) having the highest GPA. The Society also awards certificates to students with GPAs above 3.25.

In the spring, the School honors its graduates. Those in the top tenth of the class graduate with *high honors* and those in the second tenth of the class graduate with *honors*. The faculty presents the following academic achievement awards to members of the graduating class at the Spring Honors Convocation:

School of Pharmacy Gold Medals for General Excellence. The students who receive this award have attained the highest general average in the entry-level program and in the Nontraditional Pathway.

The Excellence in Pharmaceutical Care Award. The Nontraditional Pathway preceptors and mentors give this award to a student who has excelled in his/her practice setting.

Andrew G. DuMez Award. In memory of Dr. Andrew G. DuMez, former dean and professor of pharmacy, Mrs. DuMez provides a gold medal, awarded to a student for superior proficiency in pharmacy.

Epsilon Alumnae Chapter, Lambda Kappa Sigma-Cole Award. A student receives this award, in memory of Dr. B. Olive Cole, former acting dean, for proficiency in pharmacy administration.

Kappa Chapter, Alpha Zeta Omega Fraternity Prize. The Kappa Chapter of the Maryland Alumni Chapter of the Alpha Zeta Omega fraternity provides a prize which is awarded to a student for proficiency in pharmacology.

William Simon Memorial Prize. In honor of the late Dr. William Simon, a professor of chemistry in the School for 30 years, a student is awarded a gold medal for superior work in the field of biomedical chemistry.

Dr. and Mrs. Frank J. Slama Scholarship Award. A fund has been established in honor of the late Dr. Frank J. Slama, former professor of pharmacognosy. A student receives this award for superior work in the field of biopharmacognosy.

Frank J. Slama Award by the School's Alumni Association. In tribute to Dr. Frank J. Slama, Class of 1924, a former professor and head of the Department of Pharmacognosy, for over half a century of loyalty and service to his profession, to the School and to the Alumni Association, the School's Alumni Association gives this award to a member of the graduating class who excelled in extracurricular activities.

Wagner Pharmaceutical Jurisprudence Prize. In memory of her husband, Manuel B. Wagner, and her son, Howard J. Wagner, both alumni of the School, the late Mrs. Sadie S. Wagner, and her daughter, Mrs. Phyllis Wagner Brill Snyder, fund a prize for a graduating student for meritorious academic achievement in pharmaceutical jurisprudence.

John E. Wannewetsch Memorial Prize. In memory of her brother, Dr. John E. Wannewetsch, a distinguished alumnus of the School, Mrs. Mary H. Wannewetsch funds a prize for a graduating student who has exhibited exceptional performance and promise in the practice of community pharmacy.

The Conrad L. Wich Pharmacognosy Prize. In appreciation of the assistance which the Maryland College of Pharmacy extended to him as a young man, Mr. Conrad L. Wich established a fund, the income from which is awarded annually by the faculty assembly to the student who has done exceptional work throughout the course in pharmacognosy.

L.S. Williams Practical Pharmacy Prize. A bequest provided by the late L.S. Williams funds the L.S. Williams Practical Pharmacy Prize, given to the student having the highest general average throughout the course in basic and applied pharmaceuticals.

ACADEMIC STATUS POLICIES

Students' performance in didactic and experiential learning courses is continually monitored. Students are responsible for their academic progress and should take the initiative to meet their academic advisor and/or the coursemaster(s) when academic problems occur. The director for student services, the class advisor, faculty and administration are available to help students meet the School's academic standards. Experience has demonstrated that the earlier and more actively students recognize and address potential problems, the greater their likelihood of avoiding academic difficulties. By the same token, faculty members are encouraged to initiate discussions with students whose performance appears likely to result in a failing grade.

To remain in acceptable academic standing and to be eligible for graduation, students must maintain a minimum cumulative GPA of 2.0 in required courses. Students with a cumulative GPA below 2.0 or a failing grade in a didactic or experiential learning course are subject to academic dismissal.

At the end of each semester, the associate dean of student affairs reviews the academic status of all students in the PharmD program. Students with a failing grade in any course are subject to academic dismissal as soon as the failing grade is submitted in writing to the Student Affairs Office. Students who do not achieve a minimum cumulative GPA of 2.0 in their required courses are subject to academic dismissal.

Students with a semester GPA below 2.0 but maintain a cumulative GPA of 2.0 or greater will receive a letter of academic warning from the associate dean of student affairs. The Chair of the Student Affairs Committee and students' academic advisors also receive a copy of this letter.

The associate dean of student affairs will send, via certified mail, a notification letter and a copy of the Academic Status Policies and Procedures to students subject to academic dismissal. The letter will indicate that the student will be dismissed from the School unless the he/she appeals to the Student Affairs Committee requesting to be placed on academic probation. The letter will state the time and place of the academic review hearing with the Student Affairs Committee (typically within seven calendar days of the letter's date). The Chair of the Student Affairs Committee and student's academic advisors also receive copies of the letter.

Students subject to academic dismissal have the right to appeal to the Student Affairs Committee. Students may present their case in person before the committee or submit a written appeal. Students may submit any documents that they deem pertinent. Students who do not appeal will be dismissed from the School.

At least seven calendar days before any Student Affairs Committee academic review hearing, the committee will distribute a confidential memo to the faculty listing all students to be reviewed. The memo will state the time and place of the hearing, stress the confidential nature of the information and request that faculty provide the committee with pertinent information on students' academic performance and ability. Any faculty member may provide written comments to the committee or request permission to appear at any student's hearing.

Academic advisors and other faculty members may attend academic review hearings and present pertinent information. The committee will consider pre-pharmacy grades, prior academic performance in the School, and personal issues in its deliberations.

At the conclusion of the academic review hearing, the committee will deliberate on each case and determine each student's academic status. The committee decides by a simple majority vote to either academically dismiss students, place them on academic probation or gather more information. If placed on academic probation, students will be allowed to continue in the program but under specific terms outlined by the committee, such as taking remedial courses to strengthen specific knowledge or skills. If the committee decides to gather more information, it must complete its review and make a final decision within five calendar days of the original hearing. The committee will submit its decision in writing to the students, dean, and the students' academic advisors within seven calendar days of the academic review hearing.

Students have the right to appeal the decision of the Student Affairs Committee directly to the dean. Students must submit appeals in writing and state the basis for the appeal. Students must complete all appeals before the beginning of the next semester. The dean's decision is final.

Students on academic probation must meet with their academic advisor and the associate dean of student affairs to develop a plan of action to resolve all pertinent academic issues. While on probation, students must earn a GPA of 2.0 or greater during each semester. If students on probation earn a semester GPA of 2.0 or greater, but the cumulative GPA or the required-course GPA remains below 2.0, students will remain on academic probation. Students will be removed from probation when their cumulative GPA and required-course GPA is 2.0 or greater. Students with a failing grade on their record will remain on probation until they receive a passing grade.

Students who are academically dismissed may petition the Admissions Committee for readmission after they have completed some form of remediation. Students who have been academically dismissed twice from the School are not eligible for readmission.

ACADEMIC INTEGRITY

STUDENT HONOR CODE POLICY AND PROCEDURES

Students entering the profession of pharmacy are required to exhibit exemplary standards of conduct. Absolute honesty is imperative for a health professional. On May 14, 1998, the Student Government Association adopted the following Honor Code:

I. Statement of Philosophy

The students of the University of Maryland School of Pharmacy recognize that honesty, truth, and integrity are values central to the School's mission as an institution of higher education. Therefore, the Student Government Association has assembled current policies and procedures involving academic integrity into this "Honor Code" of behavior. The code described in this document articulates the responsibilities of Doctor of Pharmacy students, graduate students, faculty and administration in upholding academic integrity, while at the same time respecting the rights of individuals to the due process offered by administrative hearings and appeals. All persons enrolled in any course or program offered by University of Maryland School of Pharmacy and all persons supervising the learning of any student are responsible for acting in accordance with the provisions of this policy.

Student Responsibilities

- Understanding the types of conduct which are deemed unacceptable and, therefore, are prohibited by this policy.
- Refraining from committing any act of cheating, plagiarizing, facilitating academic dishonesty, abusing academic materials, stealing or lying.
- Reporting every instance in which the student has a suspicion or knowledge that academic conduct which violates this policy or its spirit has taken place to the faculty member responsible for instruction or to a member of the Student Discipline and Grievance Committee.

Faculty Responsibilities

- Understanding the procedures of this policy relative to how faculty are to handle suspected instances of academic dishonesty.
- Developing an instructional environment that reflects a commitment to maintaining and enforcing academic integrity.
- Handling every suspected or admitted instance of the violation of the provisions of this policy in accordance with the current School and University procedures.

II. Academic Integrity

In attempt to maintain academic integrity, the Student Government Association has outlined a code of conduct (an Honor Code) which describes acceptable

behavior for students in all its academic settings. This code has been developed using University (as stated in the University's *Student Answer Book*) and School (as stated in the School's catalog) policies. Elements of this code can be categorized into six broad areas.

1. **Cheating.** Definition: Using or attempting to use unauthorized materials, information, notes, study aids or other devices, or obtaining unauthorized assistance from any source for work submitted as one's own individual efforts in any class, clinic, assignment, or examination. Examples of cheating include, but are not limited to, the following actions:
 - a. Copying from another student's paper or test, or receiving assistance from another person during an exam or other assignment in a manner not authorized by the instructor.
 - b. Possessing, buying, selling, removing, receiving, or using at any time or in any manner not previously authorized by the instructor a copy or copies of any exam or other materials (in whole or in part) intended to be used as an instrument of evaluation in advance of its administration.
 - c. Using material or equipment not authorized by the instructor during a test or other academic evaluation, such as crib notes, a calculator or a tape recorder.
 - d. Working with another or others on any exam, take home exam, computer or laboratory work, or any other assignment when the instructor has required independent and unaided effort.
 - e. Attempting to influence or change an academic evaluation, grade or record by deceit or unfair means, such as: (1) damaging the academic work of another student to gain an unfair advantage in an academic evaluation; or (2) marking or submitting an exam or other assignment in a manner designed to deceive the grading system.
 - f. Submitting, without prior permission, the same academic work which has been submitted in identical or similar form in another class or in fulfillment of any other academic requirement at the University.
 - g. Permitting another to substitute for oneself during an exam or any other type of academic evaluation.
 - h. Gaining an unfair advantage in an academic evaluation by receiving specific information about a test, exam or other assignment.
2. **Plagiarism.** Definition: Representing, orally or in writing, in any academic assignment or exercise, the words, ideas, or works of another as one's own without customary and proper acknowledgment of the source. Examples:
 - a. Submitting material or work for evaluation, in whole or in part, which has been prepared by an individual(s) or commercial service.
 - b. Directly quoting from a source without the customary or proper citation source.
 - d. Downloading material from Web sites without appropriate documentation.

3. *Facilitating Academic Dishonesty.* Definition: Helping or attempting to help another person commit an act of academic dishonesty. Examples:
 - a. Providing assistance to another during an exam or other assignment in a manner not authorized by the instructor.
 - b. Acting as a substitute for another in any exam or any other type of academic evaluation.
 - c. Providing specific information about a recently given test, exam or other assignment to another student who thereby gains an unfair advantage in an academic evaluation.
 - d. Permitting one's academic work to be represented as the work of another.
 - e. Preparing for sale, barter, or loan to another such items as unauthorized papers, notes or abstracts of lectures and readings.
4. *Abuse of Academic Materials.* Definition: Destroying or making inaccessible academic resource materials. Examples:
 - a. Destroying, hiding, or otherwise making unavailable for common use library, computer or other academic reference materials.
 - b. Destroying, hiding, or otherwise making unavailable another's notes, experiments, computer programs or other academic work.
5. *Stealing.* Definition: Taking, attempting to take, or withholding the property of another, thereby permanently or temporarily depriving the owner of its use or possession. Examples:
 - a. Unauthorized removal of library materials, examinations, computer programs, or any other academic materials, including obtaining advance access to an examination through collusion with a University employee or otherwise.
 - b. Taking another's academic work, such as papers, computer programs, laboratory experiments or research results.
6. *Lying.* Definition: Making any oral or written statement which the individual knows to be untrue. Examples:
 - a. Making a false statement to any instructor or other University employee in an attempt to gain advantage or exception.
 - b. Falsifying evidence or testifying falsely, such as in a Student Grievance Committee hearing.
 - c. Inventing or counterfeiting data, research results, research procedures, internship or practicum experiences or other information.
 - d. Citing a false source for referenced material/data.

III. Honor Pledge

In order to address the first two areas, cheating and plagiarism, the School has developed an honor pledge statement that has been used by many faculty to reinforce the importance of academic integrity. This pledge statement will be used in the following manner: Work assigned for classes, clinics, internships, and all other types of instruction offered at the School of Pharmacy may be accomplished in either of two ways: (1) as "individual" work for which the student will sign a pledge statement indicating that the work was completed independently, without

giving or receiving assistance from another; or (2) as “collaborative” work, which may be completed in collaboration with others as directed by the instructor and for which no pledge statement is required. All work is considered to be individual work unless the instructor specifies otherwise. For all “individual” work, instructors may require students to sign the following pledge statement:

“On my honor, I have neither given nor received aid on this assignment.”

Student’s signature: _____ Date: _____

Thus, students will state that the work that was submitted is their own and will be held accountable if evidence appears that is contrary to this statement. Students are reminded that neither the presence nor the absence of a signed pledge statement will allow students to violate established codes of conduct as described above.

IV. Disciplinary Procedures

As stated below, the Student Discipline and Grievance Committee will be responsible for implementing and monitoring aspects of this code for Doctor of Pharmacy students. A separate set of procedures is in place for graduate students. They should contact their graduate program director for further information. PharmD students who are found guilty of a violation of academic integrity standards will be subject to penalties deemed appropriate by the Student Discipline and Grievance Committee as stated in the committee’s policies and procedures. It is the committee’s duty to protect honest students from being taken advantage of by those who behave dishonestly. The committee will ensure any accused student of certain rights: to be informed in writing of the charges, to hear evidence presented, to question witnesses and to present witnesses. The committee shall maintain confidentiality regarding names of persons involved in honor cases. The principles and problems raised by cases, however, may be discussed with appropriate administrative and faculty representatives.

STUDENT DISCIPLINE AND GRIEVANCE POLICIES AND PROCEDURES

I. Purpose

The Student Discipline and Grievance Committee (“Committee”) is established in the School of Pharmacy to foster self-governance by the student body. The Committee hears and attempts to solve problems or complaints (“Grievances”) that involve professional students. Grievances against graduate students or faculty are handled under separate policies and procedures.

Most formal grievances are brought directly to the Committee. However, every effort will be made to informally resolve grievances outside of the Committee. Students will be encouraged to consult their class advisers, Student Government Association advisor, coursemasters, or the associate dean for student affairs regarding the informal resolution of problems.

II. Committee Composition

The Student Discipline and Grievance Committee, a sub-committee of the Student Affairs Committee, is composed of seven voting members: four students and three faculty members. The student members of the Committee will include the Student Government Association (SGA) president, the second- and third-year class presidents, and the senior student member of the Student Affairs Committee. If a grievance is made against a Nontraditional Pathway (NTPD) student, a member of the NTPD advisory board will replace the most senior student member of the Student Affairs Committee. Faculty members include the SGA faculty advisor and the third- and fourth-year class advisors. The SGA president chairs the Committee. The associate dean of student affairs serves as an ex-officio member. In the event that a grievance is filed against a NTPD student, the NTPD director will serve as an ex-officio member of the Committee.

All members of the Committee must be present at formal hearings. Members of the committee who cannot attend the hearing or must recuse themselves due to a conflict of interest will notify the chair immediately. In the event that a committee member cannot attend a formal hearing, the Committee Chair shall appoint a replacement. Each student member of the Committee unable to attend will be replaced by an elected officer in the SGA or a member of the NTPD advisory board. Each faculty member of the Committee unable to attend will be replaced by a faculty member, preferably a member of the Student Affairs Committee.

III. Preliminary Evaluation

Grievance must be submitted in writing to the SGA President, the SGA advisor or the associate dean of student affairs. Within five days of receipt of a written grievance, the SGA President, the SGA advisor, the associate dean of student affairs and either the most senior student member of the Student Affairs Committee or a member of the NTPD advisor board (as applicable) will review the facts presented and determine if the matter is grievable under this policy. If two or more individuals during the preliminary evaluation believe the matter is grievable, a formal hearing will be called by the Committee Chair. If the majority believe the matter is not grievable, the associate dean of student affairs will counsel the Grievant on alternatives.

IV. Grievance Procedure

Once the Grievance is determined to be grievable, the Respondent will be sent a letter from the Grievance Committee Chair and the associate dean of student affairs stating: 1) that a formal grievance has been filed, 2) the deadline for submission of a written rebuttal and a proposed date(s) for the formal hearing, and 3) that advice and counsel should be sought from the academic advisor. Along with the letter, the respondent will be provided with a written copy of the grievance and this policy. The Respondent will be given up to 10 days to provide a written response to the Committee Chair. The Committee will hold a formal hearing no more than five days after the deadline for receipt of the Respondent's written response.

Prior to the hearing, the Grievant's allegations and any supporting information will be provided to the Respondent for review. Likewise, the Respondent's allegations and evidence shall be provided to the Grievant for review. The associate dean of student affairs will facilitate this exchange of information. If feasible, supporting evidence will be made available to both parties no less than three days before the scheduled hearing.

The formal hearing is an internal academic process; legal counsel will not be permitted to represent either the Grievant or the Respondent. The Grievance is presented to the Committee by the Grievant or by a representative of the dean's office, in the presence of the Respondent. The presenter of the Grievance may call witnesses to present relevant information. The witnesses supporting the Grievant may be questioned by the Respondent and Committee members.

The Respondent has the right to refuse to appear before the Committee and the right to remain silent during the hearing. Refusal to appear will not be taken as an admission of guilt. The Respondent has the right to: 1) present a statement on the Respondent's behalf at the hearing, 2) present witnesses having relevant information pertaining to the Grievance and 3) present relevant evidence in the form of written or tangible materials. The witnesses supporting the Respondent may be questioned by the Grievant and Committee members.

The hearings will not be open to the public. All witnesses will be excluded from the hearing room until they are called to testify. All witnesses will be asked to affirm that any information they are presenting, including any written materials, is accurate and complete to the best of their knowledge and belief.

Upon completion of the hearing, the Committee will meet in closed session to determine whether the Grievance has been proven by the preponderance of the evidence; that is, whether on the basis of the evidence, it is more likely than not that the Grievance is a correct allegation.

The Chair will remind the Committee that it is to be free of bias concerning all aspects of the case in question. Members who wish to excuse themselves from the voting due to possible bias may do so.

The method of voting shall be by secret ballot. To sustain the grievance, a majority vote of both the faculty and student committee members is required. All other questions before the Committee may be decided by a simple majority vote. If the vote is that a Grievance is not sustained, the case is closed. A record of the case will be kept in the Committee's files until the Grievant and Respondent leave the University. If a Grievance is sustained, the Committee will decide on a course of action.

V. Course of Action

Following a vote sustaining a Grievance against a Respondent, the Committee must take one of the following courses of action:

1. Prepare a disciplinary letter stating that the Respondent acted with impropriety. This letter is not entered into the student's file but is retained in the Committee's file until the student has left the School. The letter will be sent to the Respondent within three days of the Committee's hearing. A copy of said letter will be sent to the Grievant.

2. Prepare a temporary letter of censure to remain in the student's file for at least one year. The Respondent and Grievant will be informed of the course of action in writing within three days of the Committee's action.
3. Prepare a letter of censure to remain in the student's file permanently. The Respondent and Grievant will be informed of the course of action in writing within three days of the Committee's action.
4. Recommend to the Student Affairs Committee that the Respondent be placed on disciplinary probation, not to exceed one year.
5. Recommend to the Student Affairs Committee that the Respondent be suspended from the School for a period of time not to exceed one year.
6. Recommend to the Student Affairs Committee that the Respondent be dismissed from the School.

In addition to the actions stated above, the Committee may place other requirements on the Respondent that relate to the case (e.g., to make restitution or repairs when property is damaged, to seek counseling for emotional issues).

VI. Appeal to the Dean

A Respondent or Grievant may appeal any recommended action to the dean. The appeal must be made in writing and must be filed in the dean's office. The appeal should describe the basis for the appeal. The appeal must be based on new evidence or relevant facts not produced in the hearing, a claim of inadequate consideration of specific evidence, a claim that a rule or regulation of the University or School applied in the case is not applicable or a claim that the disciplinary action is unduly severe or lenient.

After reviewing the Grievance Committee's report, the recommendation from the Student Affairs Committee and any appeal(s) from the Respondent or Grievant, the dean will make a final decision to accept the recommendation or remand the matter for reconsideration to the Grievance Committee. The dean will generally make a final decision within 14 days after receiving the Student Affairs Committee's recommendation and the Grievance Committee's report. If the appeal is denied, the dean's action is final.



Mr. Fred Abramson assists Bruce Cao and Flora Dasgupta in the computer lab.

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Joseph Schuman, BSP, Maryland Rehabilitation Center Pharmacy
Rizwan A. Shah, MS, Weis Pharmacy
Kelly K. Shanahan, BSP, Kmart Pharmacy
Kelly Shaner, BSP, The Pharmacy at Fairmont Hill
Winette Sherard, BSP, Walter P. Carter Center
Chong W. Shin, BSP, University of Maryland Medical System
Robert Sinker, BSP, Potomac Village Pharmacy
Deborah Smith, BSP, Kaiser Permanente
John Smith, BSP, Giant Pharmacy
Gary Sobotka, BSP, CVS Pharmacy
Suzanne L. Spurr, PharmD, Wal-Mart Pharmacy
Leila V. Stecklein, PharmD, Kaiser Kensington Pharmacy
Carol Stevenson, BSP, Metro Pharmacy
Jerry Stewart, BSP, Memorial Hospital
Richard Stewart, BSP, Wal-Mart Pharmacy
Gary Ross Stout, BSP, Safeway Pharmacy
Susan Sullivan, BSP, Target Pharmacy
Susan L. Summers, BSP, CVS Pharmacy
William Tabak, BSP, Rite Aid Pharmacy
Richard Tarr, BSP, Giant Pharmacy
Lawrence Taylor, BSP, CVS Pharmacy
Karen Thompson, BSP, St. John's Pharmacy

Vito Tinelli Jr., BSP, Chestertown Pharmacy
Dat T. Tran, BSP, CVS Pharmacy
Penelope Trikeriotis, BSP, Giant Pharmacy
Kathleen Truelove, BSP, The Johns Hopkins Hospital
Marshall Tsakaris, BSP, Giant Pharmacy
Todd Unruh, BSP, Wal-Mart Pharmacy
Wayne VanWie, BSP, Safeway Pharmacy
David J. Vaxmonsky, BSP, NeighborCare Pharmacies, Inc.
Rebecca A. Viola, BSP, Walter Reed Army Medical Center
Doris Voigt, BSP, Kimbrough Ambulatory Care Center
Ruth Ann Walker, BSP, NeighborCare Pharmacies, Inc.
Terrill Washington, PharmD, VA Medical Center
Marc Weinberg, BSP, Americal Pharmaceutical Services
Michael Weinstein, BSP, The Apothecary
Stephen W. Wickizer, PharmD, AHCPR
Stephen Wiener, BSP, Medical Arts Pharmacy
Dina Wolfe, BSP, Ensign Institutional Pharmacy
Jane Wuenstel, BSP, Washington Adventist Hospital
Martin Yankellow, BSP, Rite Aid Pharmacy
Irvin Yospa, BSP, Family Pharmacy of Hampstead
Deirdre Younger, BSP, Health Center Pharmacy
Jonas J. Yousem, BSP, NeighborCare Pharmacies, Inc.
Faramarz Zarfeshanfard, BSP, The Johns Hopkins Hospital
Clifford A. Zarow, MBA, University of Maryland Medical System
Robert Zepp, BSP, University of Maryland Medical System

University of Maryland Policy Statements

No provision of this publication shall be construed as a contract between any applicant or student and the University of Maryland, Baltimore. The University reserves the right to change any admission or advancement requirement at any time. The University further reserves the right to ask a student to withdraw at any time when it is considered to be in the best interest of University. Admission and curriculum requirements are subject to change without prior notice.

ELIGIBILITY TO REGISTER

A student may register at the University when the following conditions are met: (1) the student is accepted to the University, (2) the student has received approval from the unit academic administrator and (3) the student has demonstrated academic and financial eligibility.

EQUAL OPPORTUNITY

The University of Maryland is actively committed to providing equal educational and employment opportunity in all its programs. It is the University's goal to equitably represent women and minorities among its faculty, staff, and administration, so that its work force reflects the diversity of Maryland's population.

All employment policies and activities of the University shall be consistent with federal and state laws, regulations, and executive orders on nondiscrimination based on race, color, religion, age, ancestry or national origin, gender, sexual orientation, disability, marital status, and veteran status. The University forbids sexual harassment as a form of sex discrimination among the University work force.

FACULTY, STUDENT AND INSTITUTIONAL RIGHTS AND RESPONSIBILITIES FOR ACADEMIC INTEGRITY

Preamble

The academic enterprise is characterized by reasoned discussion between student and teacher, a mutual respect for the learning and teaching process, and intellectual honesty in the pursuit of new knowledge. By tradition, students and teachers have certain rights and responsibilities which they bring to the academic community. While the following statements do not imply a contract between the teacher or the institution and the student, they are nevertheless conventions which should be central to the learning and teaching process.

I. Faculty Rights and Responsibilities

- A. Faculty members shall share with students and administrators the responsibility for academic integrity.
- B. Faculty members shall enjoy freedom in the classroom to discuss subject matter reasonably related to the course. In turn, they have the responsibility to encourage free and honest inquiry and expression on the part of students.
- C. Faculty members, consistent with the principles of academic freedom, have the responsibility to present courses that are consistent with their descriptions in the catalog of the institution. In addition, faculty members have the obligation to make students aware of the expectations in the course, the evaluation procedures and the grading policy.
- D. Faculty members are obligated to evaluate students fairly, equitably and in a manner appropriate to the course and its objectives. Grades must be assigned without prejudice or bias.
- E. Faculty members shall make all reasonable efforts to prevent the occurrence of academic dishonesty through appropriate design and administration of assignments and examinations, careful safeguarding of course materials and examinations, and regular reassessment of evaluation procedures.
- F. When instances of academic dishonesty are suspected, faculty members shall have the responsibility to see that appropriate action is taken in accordance with institutional regulations.

II. Student Rights and Responsibilities

- A. Students share with faculty members and administrators the responsibility for academic integrity.
- B. Students have the right of free and honest inquiry and expression in their courses. In addition, students have the right to know the requirements of their courses and to know the manner in which they will be evaluated and graded.
- C. Students have the obligation to complete the requirements of their courses in the time and manner prescribed and to submit to evaluation of their work.
- D. Students have the right to be evaluated fairly, equitably, and in a timely manner appropriate to the course and its objectives.
- E. Students shall not submit as their own work any work which has been prepared by others. Outside assistance in the preparation of this work, such as librarian assistance, tutorial assistance, typing assistance or such special assistance as may be specified or approved by the appropriate faculty members, is allowed.
- F. Students shall make all reasonable efforts to prevent the occurrence of academic dishonesty. They shall by their own example encourage academic integrity and shall themselves refrain from acts of cheating and plagiarism or other acts of academic dishonesty.

- G. When instances of academic dishonesty are suspected, students shall have the right and responsibility to bring this to the attention of the faculty or other appropriate authority.

III. Institutional Responsibilities

- A. Constituent institutions of the University System of Maryland shall take appropriate measures to foster academic integrity in the classroom.
- B. Each institution shall take steps to define acts of academic dishonesty, to ensure procedures for due process for students accused or suspected of acts of academic dishonesty, and to impose appropriate sanctions on students found to be guilty of acts of academic dishonesty.
- C. Students expelled or suspended for reasons of academic dishonesty by any institution in the University System of Maryland shall not be admissible to any other USM institution if expelled, or during any period of suspension.

Approved November 30, 1989 by the Board of Regents.

SCHEDULING OF ACADEMIC ASSIGNMENTS ON DATES OF RELIGIOUS OBSERVANCE

It is the policy of the University of Maryland to excuse the absence(s) of students that result from the observance of religious holidays. Students shall be given the opportunity, whenever feasible, to make up, within a reasonable time, any academic assignments that are missed due to individual participation in religious observances. Opportunities to make up missed academic assignments shall be timely and shall not interfere with the regular academic assignments of the student. Each school/academic unit shall adopt procedures to ensure implementation of this policy.

CONFIDENTIALITY AND DISCLOSURE OF STUDENT RECORDS

It is the policy of the University of Maryland to adhere to the Family Educational Rights and Privacy Act (Buckley Amendment). As such, it is the policy of the University (1) to permit students to inspect their education records, (2) to limit disclosure to others of personally identifiable information from education records without students' prior written consent and (3) to provide students the opportunity to seek correction of their education records where appropriate. Each school shall develop policies to ensure that this policy is implemented.

REVIEW OF ALLEGED ARBITRARY AND CAPRICIOUS GRADING

It is the policy of the University of Maryland that students be provided a mechanism to review course grades that are alleged to be arbitrary or capricious. Each school/

academic unit shall develop guidelines and procedures to provide a means for a student to seek review of course grades. These guidelines and procedures shall be published regularly in the appropriate media so that all faculty and students are informed about this policy.

SERVICE TO THOSE WITH INFECTIOUS DISEASES

It is the policy of the University of Maryland to provide education and training to students for the purpose of providing care and service to all persons. The institution will employ appropriate precautions to protect providers in a manner meeting the patients' or clients' requirements, yet protecting the interest of students and faculty participating in the provision of such care or service.

No student will be permitted to refuse to provide care or service to any assigned person in the absence of special circumstances placing the student at increased risk for an infectious disease. Any student who refuses to treat or serve an assigned person without prior consent of the School involved will be subject to penalties under appropriate academic procedures, such penalties to include suspension or dismissal.

UNIVERSITY OF MARYLAND POSITION ON ACTS OF VIOLENCE AND EXTREMISM WHICH ARE RACIALLY, ETHNICALLY, RELIGIOUSLY OR POLITICALLY MOTIVATED

The Board of Regents strongly condemns criminal acts of destruction or violence against the person or property of others. Individuals committing such acts at any campus or facility of the University will be subject to swift campus judicial and personnel action, including possible suspension, expulsion or termination, as well as possible state criminal proceedings.

UNIVERSITY POLICY ON SEXUAL ASSAULT

I. Purpose and Applicability

The University System of Maryland and its constituent institutions adopt this policy* on sexual assault, consistent with the requirements of (i) section 484 (f) of the Higher Education Act of 1965, as amended by section 486 (c) (2) of the Higher Education Amendments of 1992, and (ii) section 11-701 of the Education Article of the Annotated Code of Maryland. This policy applies to all students and employees, both faculty and nonfaculty members, of the University System of Maryland or its constituent institutions.

II. Definitions

The following policy recognizes two levels of sexual assault:

- **Sexual Assault I:** By stranger or acquaintance, rape, forcible sodomy, or forcible sexual penetration, however slight, of another person's anal or geni-

tal opening with any object. These acts must be committed either by force, threat, intimidation, or through the use of the victim's mental or physical helplessness of which the accused was aware or should have been aware.

- **Sexual Assault II:** By stranger or acquaintance, the touch of an unwilling person's intimate parts (defined as genitalia, groin, breast, or buttocks, or clothing covering them) or forcing an unwilling person to touch another's intimate parts. These acts must be committed either by force, threat, intimidation, or through the use of the victim's mental or physical helplessness of which the accused was aware or should have been aware.

III. Responsibilities of the Chief Executive Officer

Each chief executive officer of a constituent institution shall have the following responsibilities pursuant to this policy: (a) identification of the person responsible for coordinating the constituent institution's educational program to promote awareness of sexual assault, (b) identification of the person who will serve as the initial contact after an alleged sexual assault has occurred, and (c) adoption of procedures to be followed should a sexual assault occur, including the importance of preserving evidence as may be necessary to the proof of criminal sexual assault, and to whom the alleged offense should be reported.

IV. Educational Programs to Promote Awareness of Sexual Assault

Each institution in the University System of Maryland shall make available to its students, faculty members, and employees programs to promote awareness of what constitutes sexual assault, how to prevent it, and what the institution's procedures are for handling reports of alleged sexual assault. In addition to general educational programs for the campus community, each institution shall provide specialized training on the topic of sexual assault and the provisions of sexual assault procedures to those individuals who might be involved in providing services to or interacting with alleged victims so as to ensure timely, accurate, and sensitive assistance to all concerned. The USM policy, together with the institution's procedures concerning sexual assault, shall be distributed to all students, faculty members, and employees and shall be posted in appropriate locations at the institution and published in appropriate institution and USM publications.

V. Off-Campus Reporting of Sexual Assaults

When a report of sexual assault is made to the institution's initial contact, that person will encourage the alleged victim to contact law enforcement or medical personnel as soon as possible following the incident to receive guidance in the preservation of evidence needed for proof of criminal assault and the apprehension and prosecution of assailants. Campus authorities will assist in notification of off-campus authorities at the request of the alleged victim. Additionally, campus personnel will retain the right to contact law enforcement personnel directly where an issue of campus security is involved.

Campus personnel will also assist the alleged victim in obtaining medical attention, if the victim chooses, including providing transportation to the hospital or other emergency medical facility. Each institution shall designate one or more nearby hospitals which are equipped with the Maryland state police sexual assault evidence collection kit.

(Approved by the University System of Maryland Board of Regents, Dec. 1, 1995.)

POLICY ON SEXUAL HARASSMENT

I. Policy

The University of Maryland prohibits sexual harassment of students by colleagues or faculty members. Sexual harassment is an infringement of an individual's right to work and study in an environment free from unwanted sexual attention and sexual pressure of any kind. It can result in a significant human resource drain for the University and hinder the scholastic efforts of students.

II. Definition of Sexual Harassment

The University has adopted the definition of sexual harassment used by the U.S. Equal Employment Opportunity Commission. Unwelcome sexual advances, unwelcome requests for sexual favors, and other behavior of a sexual nature constitute sexual harassment when:

- submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment by the University or an individual's participation in a University educational program,
- submission to or rejection of such conduct by an individual is used as the basis for academic or employment decisions affecting that individual, or
- such conduct has the purpose or effect of unreasonably interfering with an individual's academic or work performance, or of creating an intimidating, hostile, or offensive educational or working environment.

III. Examples of Sexual Harassment

Sexual harassment can include any or all of the following behaviors, as well as others which are not listed:

- harassment through public or private insult, sexually-suggestive comments concerning a person's body or behavior and sexual demands
- subtle or overt pressure to comply with demands of sexual activity
- remarks about another person's clothing, body, sexual activities, sexual preferences, or sexual orientation, as well as teasing, jokes, remarks, or gestures that are sexual in nature
- unnecessary touching, pinching, patting, or exposure of another person's body
- unwarranted staring at another person's body
- unwanted communications of a sexual nature in writing, by telephone, or by other means

- requests or demands for sexual favors accompanied by implied or overt threats about job, grades, clinical assignments, class academic assignments, recommendations, and so on
- repetition of unwanted invitations for dates
- physical assault of a sexual nature, up to and including attempted or actual rape

A. Students' Remedies

Sexual harassment of students by students or faculty or staff members will not be tolerated. Proven harassment will result in disciplinary action, possibly including suspension, expulsion, or dismissal.

Student questions about peer or faculty behavior that may constitute sexual harassment and student questions about disciplinary policies should be directed to the assistant vice president for Student Affairs at 410-706-8323, to the campus manager of affirmative action at 410-706-7302, or to the student affairs dean of the school involved.

A complaint of sexual harassment may be made initially to a school's dean, the appropriate disciplinary body of the school, or the assistant vice president for Student Affairs. The assistant vice president for Student Affairs should be notified of any complaint filed with another office. Investigation of complaints will be made through appropriate school judicial bodies whenever feasible. If a complaint involves people from more than one school, the assistant vice president for Student Affairs will work with the deans of the schools involved to develop an appropriate investigational process.

Timely reporting of allegations of sexual harassment is crucial. It permits effective University intervention to protect students and educate and discipline offenders. Incidents of sexual harassment should be documented promptly and reported as soon as practical. Reporting within the time limits set in a school's judicial policy is strongly encouraged. Reporting an incident of harassment more than 30 days after it occurs can hinder the ability of the University to investigate the matter. Nevertheless, the University will investigate any complaint filed within a reasonable time. Institutional investigations of sexual harassment charges often require the complainant's identity to be known by the accused. However, complainants should be aware that the University will not tolerate or condone any form of retaliation against a student complainant whose sexual harassment claim is made in good faith.

The Counseling Center can be useful in helping students cope with the stress resulting from sexual harassment or participating in campus proceedings to investigate sexual harassment charges. Call 410-328-8404 for more information about the campus counseling service.

Through the assistant vice president for Student Affairs, the student affairs dean of each school, or the managers of affirmative action, sexual harassment educational programs for students can be arranged.

STUDENT RESIDENCY CLASSIFICATION FOR ADMISSION, TUITION, AND CHARGE-DIFFERENTIAL PURPOSES

I. Policy

It is the policy of the University System of Maryland Board of Regents to recognize the categories of in-state and out-of-state students for purposes of admission, tuition, and charge differentials at those constituent institutions where such differentiation has been established. The student is responsible for providing the information necessary to establish eligibility for in-state resident status.

Students who are financially independent or financially dependent, as defined herein, shall have their residency classification determined on the basis of permanent residency which for purposes of this policy shall be determined by the criteria set forth in I.A. through E. below. A student will be assigned in-state status for admission, tuition, and charge-differential purposes only if the student, or in the case of a financially-dependent student, the student's parent, guardian, or spouse, fulfills all of the following.

- A. For at least 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the petition applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must:
- own and continuously occupy or rent and continuously occupy living quarters in Maryland. There must exist a genuine deed or lease in the individual's name reflecting payments or rents and terms typical of those in the community at the time executed. People not having such a lease may submit an affidavit reflecting payments or rents and terms as well as the name and address of the person to whom payments are made which may be considered as meeting this condition. As an alternative to ownership or rental of living quarters in Maryland, a student may share living quarters in Maryland which are owned or rented and occupied by a parent, legal guardian, or spouse;
 - maintain within Maryland substantially all personal property;
 - pay Maryland income taxes on all earned taxable income, including all taxable income earned outside the state;
 - receive no public assistance from a state other than Maryland or from a city, county, or municipal agency other than one in Maryland; and
 - have a legal ability under federal and Maryland law to reside permanently in Maryland without interruption.
- B. For at least 11 consecutive months immediately prior to and including the last date available to register for courses in the semester for which the application applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must:
- register all owned motor vehicles in Maryland, and
 - obtain a valid driver's license issued by the state of Maryland, if licensed to drive in any other jurisdiction.

- C. Within the 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the application applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must register to vote in Maryland, if registered in any other jurisdiction.
- D. A financially independent student classified as in-state loses that status at such time as the student no longer meets one or more of the criteria set forth in I.A. through C above. A financially-dependent student classified as in-state loses that status at such time as the parent, guardian, or spouse on whom the status was based no longer meets one or more of those criteria.
- E. In addition, people in the following categories shall be accorded the benefits of in-state status for the period in which any of the following conditions apply:
- a full- or part-time (at least 50 percent) regular employee of the University System of Maryland
 - the spouse or dependent child of a full- or part-time (at least 50 percent) regular employee of the University System of Maryland
 - a full-time active member of the Armed Forces of the United States whose home of residence is Maryland or one who resides or is stationed in Maryland, or the spouse, or a financially-dependent child of such a person
 - for University of Maryland University College, a full-time active member of the Armed Forces of the United States on active duty, or the spouse of a member of the Armed Forces of the United States on active duty
 - a graduate assistant appointed through the University System of Maryland for the semester or session of the appointment. Except through prior arrangement, status is applicable only for enrollment at the institution awarding the assistantship
- F. Students not entitled to in-state status under the preceding paragraphs shall be assigned out-of-state status for admission, tuition, and charge-differential purposes.

II. Procedures

- A. An initial determination of in-state status will be made by the University at the time a student's application for admission is under consideration. The determination made at that time, and any determination made thereafter, shall prevail for each semester or session until the determination is successfully challenged in a timely manner.
- B. A change in residency status must be requested by submitting a University System of Maryland "Petition for Change in Residency Classification for Admission, Tuition and Charge Differential." A student applying for a change to in-state status must furnish all required documentation with the petition by the last published date to register for the forthcoming semester or session for which a residency classification is sought.
- C. The student shall notify the institution in writing within 15 days of any change of circumstances which may alter in-state status.

- D. In the event incomplete, false, or misleading information is presented, the institution may, at its discretion, revoke in-state status and take other disciplinary actions provided for by the institution's policy. If in-state status is gained due to false or misleading information, the University reserves the right to retroactively assess all out-of-state charges for each semester or session affected.
- E. Each institution of the University System of Maryland shall develop and publish additional procedures to implement this policy. Procedures shall provide that on request the president or designee has the authority to waive any residency criterion as set forth in section I, if it is determined that application of the criterion creates an unjust result. These procedures shall be filed with the Office of the Chancellor.

III. Definitions

- A. Financially Dependent: For purposes of this policy, a financially-dependent student is one who is claimed as a dependent for tax purposes, or who receives more than one-half of his or her support from a parent, legal guardian, or spouse during the 12-month period immediately prior to the last published date for registration for the semester or session. If a student receives more than one-half of his or her support in the aggregate from a parent, legal guardian, or spouse, the student shall be considered financially dependent on the person providing the greater amount of support. The dependent relationship must have formally existed by legally-contracted marriage or court order recognized under the laws of the state of Maryland for at least 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the petition applies.
- B. Financially Independent: A financially-independent student is one who (a) declares himself or herself to be financially independent as defined herein, (b) does not appear as a dependent on the federal or state income tax return of any other person, (c) receives less than one-half of his or her support from any other person or people, and (d) demonstrates that he or she provides through self-generated support one-half or more of his or her total expenses.
- C. Parent: A parent may be a natural parent, or if established by a court order recognized under the laws of the state of Maryland, an adoptive parent.
- D. Guardian: A guardian is a person so appointed by a court order recognized under the laws of the state of Maryland.
- E. Spouse: A spouse is a partner in a legally-contracted marriage as recognized under the laws of the state of Maryland.
- F. Self-generated: Describes income which is derived solely from compensation for an individual's own efforts as evidenced, for example, by federal or state W-2 forms or IRS Form 1099, in which interest income is based upon finances created from one's own efforts. For the purposes of this policy, grants, stipends, awards, benefits, loans, and gifts (including federal and state aid, grants, and loans) may not be used as self-generated income.

- G. Regular Employee: A regular employee is a person employed by the University System of Maryland who is assigned to a state budget line. Examples of categories not considered regular employees are graduate assistants, contingent employees, if-and-when-needed, and temporaries.

Approved by the University System of Maryland Board of Regents, Aug. 28, 1990; amended July 10, 1998.)

SMOKING

Consistent with state law, state regulation, the executive order of the governor of the state of Maryland, and in accordance with recommendations of numerous governmental and scholarly organizations, the University of Maryland relies upon prevention of adverse health effects in its smoking policy. According to this policy, nonsmoking employees and students are discouraged to start smoking and smokers are encouraged to give up smoking. Furthermore, smoking is prohibited in University buildings.

Elements of the campus smoking policy are as follows:

- A. The smoking of tobacco products is not permitted in any campus building, facility, state vehicle, or shuttle bus. This applies to all faculty and staff members, students, contractors, visitors, and so on.
- B. Tobacco products will not be available for purchase on campus.
- C. There shall be no smoking in meetings, conferences, or training sessions hosted by the University on- or off-campus. In order to accommodate smokers as well as nonsmokers, breaks may be requested in meetings lasting longer than one hour.
- D. All employees are expected to bring to the attention of contractors and visitors the smoking prohibition policy of the University. Politeness and common sense as well as the law should guide employees and students in the enforcement of this section.
- E. Potential conflicts resulting from this policy and its implementation are to be resolved by the normal channels of the University of Maryland, including the Office of Human Resource Services in conjunction with Environmental Health and Safety.
- F. The University Health and Safety Committee serves as the campus smoking policy implementation committee and is responsible for developing policies and for guiding EHS and other University offices in the implementation of the smoking policies and appropriate educational activities.
- G. Anyone found in violation of this policy should be advised to cease smoking immediately, and, if noncompliant, shall be subject to the state law. In addition, an employee or student found to be in noncompliance shall be subject to administrative and disciplinary action.

(Approved by the President, effective September 1986; revised January 1999.)

STUDENT RIGHT-TO-KNOW AND CAMPUS SECURITY ACT

The Student Right-to-Know and Campus Security Act (Public Law 101 542), signed into federal law Nov. 8, 1990, requires that the University of Maryland make readily available to its students and prospective students the information listed below. Should you wish to obtain any of the following information, send your name, address, school, and program, and a listing of the items of interest to:

Office of Student Services
Attention: Student Right-to-Know Request
University of Maryland
621 W. Lombard St., Room 302
Baltimore, MD 21201

- Financial Aid
- Costs of Attending the University of Maryland
- Refund Policy
- Facilities and Services for Students with Disabilities
- Procedures for Review of School and Campus Accreditation
- Completion and Graduation Rates for Undergraduate Students
- Loan Deferral Under the Peace Corps and Domestic Volunteer Services Act
- Campus Safety and Security
- Campus Crime Statistics
- Student Sexual Orientation Nondiscrimination

I. Background

Effective July 11, 1997, the University System of Maryland Board of Regents specifically prohibited discrimination against students on the basis of sexual orientation in academic admissions, financial aid, educational services, housing, student programs and activities, and recruitment. The board reserved the right to enforce or comply with any federal or state law, regulation or guideline, including conditions for the receipt of federal funding. This University reiterates its commitment to the most fundamental principles of academic freedom, equality of opportunity, and human dignity by requiring that treatment of its students and applicants for admission be based on individual abilities and qualifications and be free from invidious discrimination.

II. Related Employment Policy

University students who are also University employees should be aware of the "Employee Sexual Orientation Nondiscrimination Policy and Procedures."

III. Definition

Sexual orientation is the identification, perception, or status of an individual as to homosexuality, heterosexuality, or bisexuality.

IV. Policy

Consistent with USM's policy, it is this University's policy that:

- within the University, the educational environment will be free of discrimination on the basis of sexual orientation, and
- University students are prohibited from discriminating on the basis of sexual orientation against fellow students, University personnel, and other people with whom the students interact during the course of their educational experiences both on- and off-campus. Students may be disciplined for violation of this policy.

V. Procedures

A student's questions about peer or staff or faculty member behavior that may constitute discrimination based on sexual orientation and a student's questions about disciplinary policies should be directed to the assistant vice president for Student Affairs at 410-706-8323, to the campus director of Employee Relations and Diversity Initiatives at 410-706-7302, or to the student affairs dean of the student's school. A complaint of discrimination based on sexual orientation may be made initially to the dean of the complaining student's school, to the appropriate student or school judicial board of the complaining student's school, or to the assistant vice president. The assistant vice president should be notified of any complaint filed with another office. Investigation of complaints will be made through appropriate school judicial bodies whenever feasible. If a complaint involves people from more than one school, the assistant vice president will work with the deans of the schools involved to develop an appropriate investigational process. To determine whether alleged conduct constitutes discrimination on the basis of sexual orientation, the University will look at the record as a whole and at the totality of the circumstances. The determination of whether a particular action is discrimination will be made from all the facts, on a case-by-case basis.

Timely reporting of allegations of discrimination based on sexual orientation is crucial. It permits effective University intervention to protect students and educate and discipline offenders. Incidents of discrimination should be documented promptly and reported as soon as practical. Reporting within the time limits set in a school's judicial policy is strongly encouraged. Reporting an incident of discrimination more than 30 days after it occurs can hinder the ability of the school and institution to investigate the matter. Nevertheless, the school and institution will investigate any complaint filed within a reasonable time.

Institutional investigations of discrimination based on sexual orientation charges often require the complainant's identity to be known by the accused. However, complainants should be aware that the University will not tolerate or condone any form of retaliation against a student complainant whose discrimination claim is made in good faith. Deliberate filing of false accusations may be the basis for independent disciplinary action against the accuser.

VI. Complaints Involving Affiliates' Employees

Many University students will be supervised by employees of the University's affiliates and teaching sites during their educational experiences. If a student experiences discrimination on the basis of sexual orientation in such a setting, the University will attempt to resolve the issue and will attempt to reassign the student if a resolution is not feasible.

VII. Counseling

The Counseling Center offers assistance in coping with the stress resulting from discrimination based on sexual orientation or participation in campus proceedings to investigate such discrimination charges. Call 410-328-8404 for more information about campus counseling services.

VIII. Educational Programs

Programs for students about discrimination based on sexual orientation can be arranged through the assistant vice president for Student Affairs, the student affairs dean of each school, or the director of Employee Relations and Diversity Initiatives.

(Approved by the President, October 1997.)



Dr. Magaly Rodriguez deBittner instructs Melanie Ruane about proper patient assessment skills.

Course Descriptions

FIRST-YEAR COURSE DESCRIPTIONS

PHAR 511—Biochemistry I (2), Fall Semester (Aldrich)

PHAR 521—Biochemistry II (3), Spring Semester (DiGate)

A course of study which builds on the principles of cell biology and genetics with a systematic consideration of the chemical components and requirements of living systems from the molecular to the cellular level. These fundamentals of biochemical structure, function and energetics provide a platform for comprehension of pharmaceutical biotechnology, and for understanding determinants of disease, the pathobiochemistry of organ systems, mechanisms of drug action and adverse reactions and novel drug delivery systems.

PHAR 512—Cell Biology (2), Fall Semester (DiGate)

Introductory appreciation of the cell, the fundamental unit of the body. The integration of cell structure and molecular functions is developed with discussions of topics such as the history of modern biology; the basic principles of cellular cytoarchitecture and organization; membrane functions; biochemical structure, functions and energy conversion; cell-to-cell signaling; the flow of genetic information from DNA to RNA to proteins; cell division; human and Mendelian genetics; and human diversity.

PHAR 513—Drug Chemistry (2), Fall Semester (Wright)

A study of the principles of organic chemistry that comprise basic elements of pharmaceutical science. The emphasis is on the relationship between molecular structure and chemical, physical and biophysical properties of systems that arise from molecular interactions. The course provides a platform for comprehension of pharmaceutical concerns such as the stability of drugs and drug products, the conformation of bioactive proteins, the basis for drug-receptor interactions, the structure of biological membranes, and major drug classes.

PHAR 514—Human Biology I (3), Fall Semester (Buterbaugh)

PHAR 524—Human Biology II (3), Spring Semester (Buterbaugh)

PHAR 534—Human Biology III (3), Fall Semester Second Year (Buterbaugh)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems.

PHAR 515—Personal Management (1), Fall Semester (Cobuzzi)

An introduction to the basic elements of social and administrative science underlying the practice of pharmacy. The student is introduced to state and federal laws including those related to negligence, standards of practice and dispensing. Organizational theories of management and leadership styles are contrasted.

PHAR 516—Pharmacy Practice and Education (3), Fall Semester (Curtis/Anderson)

This prefatory course introduces the new Doctor of Pharmacy student to the science and profession of pharmacy. The evolution and implications of pharmaceutical care and the philosophical basis for the pharmacy curriculum are discussed. Students are introduced to skills necessary for success during the four-year curriculum through the opportunity to critically evaluate problems, discuss ethical dilemmas, develop and apply computer and literature-retrieval skills, and practice verbal and written communication skills. The importance of independent and cooperative learning activities is emphasized.

PHAR 517—Study Design and Analysis (2), Fall Semester (Zito)

Students are introduced to the pivotal role of study design and statistical analysis considerations in the design and evaluation of basic, clinical, epidemiological and social science research. The course focuses on the proper design of studies with emphasis on threats to internal validity and generalizability. A variety of descriptive and inferential statistical procedures and methods are surveyed with emphasis on the interpretation of the results of research.

PHAR 522—Context of Health Care (3), Spring Semester (Palumbo)

Students actively develop a contemporary definition of health-care and critically examine the health-care system with special emphasis on relevant legislation, traditional and nontraditional providers of health-care, the organization and financing of health-care delivery, and the dynamics of pharmaceutical care within the system. The social, legal and professional implications of informatics and computer proliferation in our society is discussed with special emphasis on pharmacy practice.

PHAR 523—Ethics In Pharmacy Practice (1), Spring Semester (Love)

Introduction to the principles of ethical thinking. The philosophy of ethics and role of formal codes of professional conduct are discussed in the context of resolving conflicting ethical principals.

PHAR 525—Immunology (2), Spring Semester (Hayashi)

The natural and acquired protective mechanisms of the immune system are discussed with topics ranging from the structure, function and specificity of antibodies; B-lymphocyte and T-lymphocyte functions; initiation and control of immune responses; histocompatibility; and immune-mediated disease. The course is designed to provide the student with sufficient knowledge of humoral and cellular immunity to understand the role of the immune system in disease.

the production and use of vaccines and related biologicals, and the rapidly growing areas of transfusion, transplant and tumor immunology.

PHAR 526—Physical Chemistry (2), Spring Semester (Guiles)

A study of selected principles of physical chemistry that comprise basic elements of pharmaceutical science. The emphasis is placed on the relationship between molecular structure and the physical and biophysical properties of systems that arise from molecular interactions. The goal of the course is to apply the principles of physical chemistry to the practice of pharmacy.

PHPC 527—Introduction to Professional Practice (1), Fall/Spring Semesters (Rumrill) (Register Spring Semester, First Year)

Students observe the practice of pharmacy in community, institutional, and specialty practice environments. Students analyze the types of services provided in each setting and the personnel involved in the delivery of those services. Students learn the basic elements of pharmaceutical care, including obtaining patient histories and prescription dispensing. An important goal of this course is for students to identify and assess career options in pharmacy practice. These activities are closely linked to PHAR 516—Pharmacy Practice and Education and to a career pathway workshop.

SECOND-YEAR COURSE DESCRIPTIONS

PHPC 532—Longitudinal Pharmaceutical Care I (1), Fall/Spring Semesters (Rodriguez deBittner) (Register Spring Semester, Second Year)

Students observe the delivery of pharmaceutical care to patients over time. Particular attention is paid to assessing the changing needs of patients as health transitions occur. Under the supervision of an experienced pharmacy practitioner, students have regularly scheduled encounters with patients. Students learn how to effectively collect information from a variety of sources, including the patient, and prepare periodic health status reports. As students obtain knowledge and skills in didactic courses (pharmaceutics, pharmacology, human biology), they learn to explicitly apply such knowledge and skills to their patients.

PHAR 530—Microbiology/Antibiotics I (3), Fall Semester (Wang/Plaisance)

A study of the major classes of pathogenic bacteria, bacterial infectious diseases and antibacterial agents. This course surveys pertinent features of bacterial structure and virulence factors, host response and disease manifestations and antibacterial drug design, mechanisms, pharmacokinetics and toxicity profile. This course will provide the framework for consideration of the therapeutic principles involved in treating bacterial diseases.

PHAR 531—Pharmaceutical Chemistry (2), Fall Semester (MacKerell)

A presentation of the basic chemical principles underlying the activity, absorption, metabolism, excretion, physico-chemical properties and design of drug molecules, culminating in a discussion of drug classes.

PHAR 535—Pharmaceutics (3), Spring Semester (Augsburger)

The application of fundamental principles and basic science knowledge to the multidimensional problems of the formulation, development, testing, production, distribution and administration of safe, effective, stable and reliable drug delivery systems. These systems, ranging in sophistication from tablets and capsules to biodegradable implants, are discussed using a problem-based approach that focuses on the critical determinants for traditional and less-traditional routes of drug administration.

PHAR 536—Pharmacology I (2), Fall Semester (Moreton)**PHAR 546—Pharmacology II (3), Spring Semester** (Moreton)

A systematic consideration of the molecular, cellular and organismic mechanisms of drug action, organized by major drug classes. This course of study provides knowledge of the mechanisms of drug action underlying their use in the treatment of specific and general disease processes.

PHAR 537—Principles of Drug Action (2), Fall Semester (Moreton)

A study of the chemical and biological concepts which apply to the characterization, evaluation and comparison of all drugs. Topics such as dose-response and receptor theory, receptor transduction mechanisms, pharmacologic selectivity, pharmacogenetic drug tolerance and dependence, drug allergy, drug resistance and chemical mutagenesis, carcinogenesis and teratogenesis are discussed at the molecular and cellular level. The physical, biological and chemical principles underlying drug absorption, distribution, biotransformation and excretion are discussed from the molecular to the organ level.

PHAR 540—Microbiology/Antibiotics II (1), Spring Semester

(Wang/Plaisance)

A study of the major classes of pathogenic fungi and viruses, the diseases that they cause and antifungal and antiviral agents. This course surveys pertinent features of fungal and viral structure, virulence factors, life-cycle, disease manifestations and antifungal/antiviral drug design, mechanisms, pharmacokinetics and toxicity profile. This course will provide the framework for consideration of the therapeutic principles involved in treating fungal and viral diseases.

PHAR 541—Biopharmaceutics and Pharmacokinetics (3),

Fall Semester (Eddington)

In this course, the student learns how the processes of drug absorption, distribution, metabolism and excretion are coupled with dosage and the important parameters of clearance, volume of distribution and bioavailability, to determine the concentration of a drug at its sites of action in the body. The quantitative relationship between dose

and effect is developed as a framework with which to interpret measurements of drug concentrations in biological fluids.

PHAR 542—Clinical Chemistry (1), Spring Semester

(Serrero/Michocki)

Principles of analytical chemistry, clinical chemistry, enzyme assays, electrophoresis, radioactivity, magnetic resonance, biotechnology-based diagnostics and biosensors, and immunoassay are examined. Emphasis is on the application of these methods to the determination of drug concentrations in chemical and biological systems, and health promotion and assessment. Students also have opportunities to examine patient data and use commercially available diagnostic kits.

PHAR 544—Medicinal Chemistry (3), Fall/Spring Semesters

(Wright) (Register Spring Semester)

A comprehensive study of the chemistry of drug products. The course outline will follow the pharmacological classification of drug molecules, and will include discussion of chemical properties (physical and organic), stability, solubility, mechanisms of action where appropriate, and structure-activity relationships. Where possible, quantitative computer designed studies of drug development will be mentioned.

PHAR 545—Practice Management (3), Spring Semester (Abramson)

Management principles are provided to construct a practical framework for the operational management of a business of pharmacy. Elements addressed in this course include: controllable and uncontrollable variables in a free market economy, work flow analysis, accounting, budget development, purchasing, inventory control, quality assurance and third party reimbursement issues. The course also examines the current practical developments related to human resources management through integrating information on organization behavior, psychology, economics and law.

THIRD-YEAR COURSE DESCRIPTIONS

PHAR 552—Principles of Human Nutrition (1), Fall Semester

(Bergquist)

This required course builds on materials in earlier coursework including Fundamentals, Basic Science and Pharmaceutical Science. The course focuses on the preparation of pharmacists to deliver pharmaceutical care services related to patients' nutritional needs. The course prepares the student to understand principles of nutrition in relation to contemporary public health issues and to treatment of diseases and physiologic processes. The materials taught in this course are applied and further developed in subsequent modules in the Integrated Science and Therapeutics course sequence and in Longitudinal Pharmaceutical Care II.

PHAR 553—Population Based Medical Information Analysis (2),

Fall Semester (Mays)

This course is designed to enhance a student's skills in the areas of information collection, retrieval, analysis, and interpretation. A variety of topics surrounding the aspects of drug information practice will be presented including the role of informational services in health-care. Students will enhance both their written and verbal communication skills as they not only are asked to retrieve pertinent clinical information, but also then to interpret, document and integrate this information into the development of clinical practice guidelines and subsequent outcome measures.

PHAR 554, 555—Integrated Science and Therapeutics (4, 4),

Fall Semester (Hassan/Edwards)

PHAR 564, 565—Integrated Science and Therapeutics (4, 4),

Spring Semester (Buterbaugh/Klein-Schwartz)

Basic and clinical science faculty interact with students during a variety of didactic and laboratory experiences as students learn to design, implement and monitor pharmaceutical care plans for specific patients with specific diseases. Methods for the choice of drug product, definition of the specific goals of therapy, including the means to assess whether these goals are being achieved, and active intervention steps at the patient, prescriber, health-care system and population levels to ensure successful outcomes of drug therapy are developed. The courses are organized according to the major physiological systems of the human body, and the disease states commonly associated with them and encountered and observed by the pharmacy practitioner in a variety of community and institutional practice settings. A goal of these courses is to prepare students to better integrate new scientific knowledge into the successful pharmaceutical care of patients with the goal of reducing the health-care costs to patients and society. The knowledge and behaviors acquired during these courses prepare the student for the community and institutional pharmaceutical care rotations of the experiential learning program of the curriculum.

PHPC 562—Longitudinal Pharmaceutical Care II (1), Fall/Spring

Semesters (Rodriguez deBittner) (Register Spring Semester, Third Year)

This course is a continuation of PHAR 532—Longitudinal Pharmaceutical Care I. Students have periodic encounters with previously assigned patients. Students learn to assess drug therapy problems and develop pharmaceutical care plans. Particular attention is given to the needs of patients during health transitions. These experiential activities are closely linked throughout the third year to the didactic activities in the Integrated Science and Therapeutics series of courses.

FOURTH-YEAR COURSE DESCRIPTIONS

PHPC 570—Community Distributive Services (3)

PHPC 571—Institutional Distributive Services (3)

(Register Fall Semester, Fourth Year)

These required professional practice experiences may be taken any time after successful completion of the second year. They may be completed the summer after the second year, the winter session of the third year, or the summer after the third year. Each rotation is a four-week, full-time, structured program of intensive skills development related to the distributive aspects of community and institutional pharmacy. Students will learn how to competently and efficiently perform the technical functions of drug dispensing. Students learn to the use of technology as a tool in drug distribution. The roles of support personnel and methods of supervision are explored. Mechanisms for assuring the quality and accuracy of the drug distribution process are emphasized.

PHPC 572—Pharmaceutical Care I (3)

PHPC 573—Pharmaceutical Care II (3)

PHPC 574—Pharmaceutical Care III (3)

PHPC 575—Pharmaceutical Care IV (3)

Prerequisites: PHPC 571—Institutional Distributive Services and successful completion of the Integrated Science and Therapeutics course series. This series of required professional practice experiences is designed to provide the student with extensive experience in pharmaceutical care delivery in a variety of direct patient care settings. Students gain skill through daily one-on-one interactions with patients, caregivers, physicians, nurses and other health-care professionals. Each of the four required rotations runs for four week on a full-time. At least one rotation must be completed in an acute-care hospital setting and one in a community setting. Although each site will differ in terms of the patient population, disease acuity, scope of practice, resources and availability of patient-specific data, students will take responsibility for drug therapy outcomes. Students will learn to: 1) collect and record patient-specific data, 2) identify, list and assess drug-related problems, 3) develop and record pharmaceutical care plans, 4) educate patients and health-care professionals regarding the appropriate use of drugs, and 5) measure and document patient outcomes. These activities are closely linked to PHPC 576—Ambulatory Clinic and concurrent with PHPC 577—Informational Services.

PHPC 576—Ambulatory Clinic (1) (Register Spring Semester, Fourth Year)

Prerequisites: PHPC 571—Institutional Distributive Services and successful completion of the Integrated Science and Therapeutics course series. This series of required experiences is normally taken concurrently with the Pharmaceutical Care rotations (PHPC 572, 573, 574, and 575). A total of 16 half-day experiences is required, for a total of 64 hours. Following the pharmaceutical care model, students will conduct patient interviews, perform appropriate pharmacotherapy-oriented

physical assessments, order appropriate laboratory tests, initiate and/or change drug therapy regimens and conduct patient follow-up.

PHPC 577—Informational Services (2) (Register Spring Semester, Fourth Year)

Prerequisite: Successful completion of PHAR 553—Population Based Medical Information Analysis. This course must be taken concurrently with the Pharmaceutical Care rotations (PHPC 572, 573, 574, and 575). During the course of daily activities on Pharmaceutical Care and Ambulatory Clinic rotations, students learn how to receive drug information questions in a comprehensive manner, conduct timely and thorough literature searches, evaluate sources of information and provide appropriate responses. Students are also expected to subscribe to an affordable abstracting service and develop a personal information library.

PHAR 580—Pharmacy Law (2), Spring Semester (Palumbo)

An examination of the legal and regulatory issues pertaining to drugs and devices and the practice of pharmacy. Students learn the various laws and regulations which would govern their usual daily activities in a variety of practice sites.

PHAR 581—Senior Colloquium (1), Spring Semester (Curtis/DiGate)

Students deliver oral presentations to share some aspect of their educational experience, practice aspirations or career goals with their student peers and the faculty. This forum fosters a critical examination of each student's formal education in the context of the practice of pharmaceutical care.

DIDACTIC ELECTIVE COURSES

The elective didactic (PHMY) courses currently offered by the School of Pharmacy are described below. In general, higher course numbers indicate courses with important prerequisite requirements, and are designed for later years of the curriculum. Prerequisites for most electives include consent of the instructor and the student's advisor. Some electives are offered in either the fall or spring semesters and some are offered both semesters. Refer to the class schedule when making course selections.

PHMY 510—Advanced Educational Opportunities (1) (Chikhale)

This elective program provides students interested in graduate school or research careers with knowledge and information about various advanced educational opportunities in the curriculum. Aspects of careers which require advanced study are described by professionals in those career areas, and by students currently enrolled in them. The course offers diverse perspectives on goals, training, functions, settings and opportunities in research in pharmaceutical sciences and pharmacy practice.

PHMY 511—Diabetes Disease State Management (1) (McPherson)

Prerequisites: Fourth year status. This course will review the pathophysiologic changes associated with diabetes mellitus (Types I and II, impaired glucose tolerance and gestational diabetes), nonpharmacologic management (nutrition and exercise), pharmacologic management, complications of diabetes mellitus, principles of education (children, adolescents, adults and geriatrics), continuous care (skin and foot care, OTC product selection), blood and urine monitoring, special population considerations (children, adolescents, geriatrics, visually impaired patients), psychosocial aspects of diabetes (dealing with diagnosis, developing support strategies, and adherence to regimens), and how to set up a diabetes-focused practice.

PHMY 518—Drug Abuse Education (1 to 3 credits) (Tommasello)

Practice and training in the dissemination of drug information, especially drug abuse information to the public, are linked to the activities of the Student Committee on Drug Abuse Education (SCODAE). Students complete a 10-hour training session, observe community education programs presented by SCODAE, present several programs and prepare a written report on a timely topic in the area of chemical dependence.

PHMY 522—Business Plan Development (2)

An elective course for students interested in ownership or management of their own pharmacy practice emphasizing the practical problems associated with establishing a new business or expanding an existing enterprise. Location and market analysis, target marketing, revenue and expense projections and estimation of capital requirements are among the topics covered.

PHMY 523—Advanced First Aid (3) (Melton)

Advanced first aid and emergency care, including CPR.

PHMY 528—Selected Topics in Geriatrics and Gerontology (1-3)
(Brandt)

This course provides an educational experience through investigating geriatrics and gerontology at the School's Center for the Study of Pharmacy and Therapeutics for the Elderly. Through an elder-visitation experience, students select an elderly person living in the community and track the individual's pharmaceutical care needs. Students also participate in guided discussions addressing elder health-care problems and solutions.

PHMY 529—Special Group Studies (var. 1-5) (Repeatable up to 12 credits)

An omnibus course permitting experimentation with new or different subject matter and/or instructional approaches.

PHMY 529—Special/Organizational Behavior (3) (Bento)

Prerequisite: PHAR 515—Personal Management. The study of the effects of human behavior on organizational effectiveness. Attention is given to quality, team work, attitude toward work, satisfaction and commitment, building and exercising organizational power, the role of leadership, sustaining motivation, participatory decision-making, and the process for change, development and continuous improvement.

PHMY 529—Special/Marketing (3) (Pitta)

Prerequisite: PHAR 545—Practice Management. Marketing introduces methodologies for identifying changes in the organization's marketplace and adapting to them. The course uses the market orientation concept, emphasizing customer needs, total integration of the firm, and the profit potential to examine the marketing process, and in doing so, will use pharmacy based-examples.

PHMY 529—Special/Case Based Management of Infectious Diseases I (1) (Plaisance)**PHMY 529—Special/Case Based Management of Infectious Diseases II (1, 2)** (Plaisance)

Prerequisites: Third year or PHNT 545 & 546. These courses provide third- and fourth-year students and students in the Nontraditional Pathway with an opportunity to critically examine the clinical decisions made in the management of patients with infectious diseases. During the first course, students will review the therapeutic decisions made in the care of a patient encountered during an experiential course and review the literature relevant to those decisions. During the second course, students will present a case discussion including a thorough review of the standard of care and the literature support for the decisions made.

PHMY 529—Special/Financial Reporting (3) (Forgione)

This course is a study of financial reporting, analysis and strategy principles applied to for-profit and not-for-profit health-care organizations. Accounting issues related to strategic decision-making in health service production, financing, and investment will be emphasized throughout the course. Topics include the health-care accounting environment, revenue and expense recognition, balance sheet valuations, ratio analysis, budgeting and control systems, cost accounting, performance measurement, variance analysis, cost-volume-profit relationships, and capital budgeting. Special attention is given to the financial implications of third-party payment systems and measuring the profitability of managed-care contracts.

PHMY 529—Special/Geriatric Pharmacotherapy (2) (Brandt)

Prerequisites: Third year status. This course provides advanced discussion of the geriatric diseases and different presentations of disease and responses to therapy. A case-based approach expands on previous geriatric coursework and allows students to apply material to different patient-care settings. Journal club and drug information questions are utilized to illustrate concepts.

PHMY 529—Special/Geriatic Imperative (2) (Brandt)

The Geriatric Imperative Minimester is a five-day interdisciplinary course open to all University of Maryland students during the first week in January. The course presents a wide range of information on the health and well-being of older adults through clinical, research and policy presentations. Course content will be conveyed through lectures, panel discussions, team and case presentations, role play, video tapes and site visits. Students will be required to write an in-depth paper on a subject pertaining to geriatrics/gerontology within two months of completing the didactic portion of the course.

PHMY 537—Clinical Aspects of Drug Dependence (2) (Tommasello)

This course familiarizes students with the clinical aspects of chemical dependence. Special emphasis is placed on the pharmacology of commonly abused psychoactive substances and the role of pharmacological supports in the treatment of addiction.

PHMY 539—Special Projects (var. 1-3) (Repeatable up to 12 credits)

Independent investigations consisting of library or laboratory research, seminars or other assignments appropriate to the problem investigated..

PHMY 541—Introduction to the Poison Center (1) (Anderson)

This course provides students the opportunity to observe and be involved in a clinically-oriented pharmacy practice setting early in their education. Students learn about the Poison Center's operation and resources and the potential for pharmacist participation in this area of patient care. The course consists of discussion sessions, activities in the Maryland Poison Center, role playing, and laboratory sessions focusing on toxicology resources and communication skills. Students present cases on a home-management and a hospital-management drug overdose.

PHMY 543—Honors Seminar in Pharmacy Administration (1) (Zito)

A survey of current literature in the general area of pharmacy practice and administrative science. Each week, a recently published paper related to the economic, social, behavioral or educational aspects of pharmacy is discussed and evaluated. Special student research projects may also be undertaken.

PHMY 550—Adverse Drug Reactions (2) (Michocki)

Focus is on the clinical manifestations and incidence of drug reactions, systems affected, differentiation among idiosyncratic reactions, hypersensitivity reactions, extensions of pharmacologic action and assessment of drug reaction literature.

PHMY 551—Recent Advances in Pharmacology (1) (Kim)

The objective of this course is to present advances in pharmacology and toxicology. Sessions emphasize experimental and clinical findings, their interpretation and significance in relation to basic and applied aspects of pharmacology and toxicology. Attention is also given to experimental design and methodology of the studies in question.

PHMY 552—Pharmacology and Aging (1) (Weiner)

This course presents advances in our understanding of variations in drug response in the aging population. The course is designed to give students an appreciation for the basic physiological and biomedical changes which normally occur with aging, and how these changes relate to altered pharmacodynamic and pharmacokinetic responses following drug administration. Basic and clinical pharmacologic studies are used to support the conclusions presented.

PHMY 553—Consumer Education Program for Older Adults (2)

(Brandt)

This course trains students to educate the elderly about drugs and drug-taking. Students benefit from the didactic and applied aspects of the course, since they must first learn about the special needs of the elderly and then actually interact with the elderly both in large groups and one-on-one.

PHMY 554—Health Education Seminar (2) (Fedder)

The course prepares students to become effective health educators to patients, other health-care practitioners and/or the community. The theoretical and conceptual bases of the health education discipline are fully developed. Students learn the techniques of behavioral and educational diagnosis and their application to the development of educational intervention.

PHMY 556, 557—Advanced Pharmacology I&II (2, 2) (Moreton)

This course expands and extends the pharmacology material learned in the required courses PHAR 536 and 546. The course format is the discussion of assigned topics and review of original papers in a two-hour weekly session. These sessions include graduate students in the Pharmaceutical Sciences.

PHMY 560—The Pharmacist in the Critical Care Setting (1) (Hassan)

This course identifies and explores the role of the pharmacist in various critical-care settings. The student will be able to see how critical care pharmacy has evolved to complement the medical and nursing management of the critically ill patient.

PHMY 561—Advanced Therapeutics Seminar (3) (Tsoukleris)

An advanced course dealing with complex drug therapy decision-making, using case presentations and current literature. Requires active student participation in resolution of therapeutic controversies.

PHMY 562—Clinical Pharmacokinetics (2) (Reiss/Eddington)

This course provides students with the didactic training and skills necessary to conduct clinical pharmacokinetic consultation.

PHMY 563—Pharmacotherapeutic Issues in the Critically Ill Patient (2) (Hassan)

This course is an elective seminar for students interested in critical care pharmacotherapy. Topics include a broad scope of disease states and drug issues frequently encountered in an ICU setting. Presentations will identify the pharmacologic aims and controversies in the management of a particular topic, while simultaneously underscoring the complexities of drug therapy in the critically ill patient, which may lead to untoward reactions or suboptimal care.

PHMY 567—Advanced Cardiac Life Support (2) (Roffman)

This course focuses on the role of the pharmacist in the setting of cardiac arrest. A lecture format covers the pathophysiology, epidemiology, therapeutic goals and treatment modalities in cardiac arrest as described by the Standards and Guidelines developed by the National Conference on Cardiopulmonary Resuscitation and Emergency Cardiac Care. Topics include the role of the pharmacist on the cardiac arrest team, an in-depth discussion of the role of pharmacologic intervention, techniques of basic and advanced cardiac life support and post-resuscitative care.

PHMY 574, 575—Pharmacotherapeutics I, II (2, 2) (Roffman)

Pharmacotherapeutics is a course in advanced therapeutic decision-making which parallel the therapeutic topics offered in the Integrated Science and Therapeutics modules during the third year of the curriculum. The course require students to formulate therapeutic decisions based upon case materials and emphasize the process of decision-making in the presence of multiple patient and agent variables. As the number of cumulative therapeutic topics increases, the complexity of the decision making increases. Students are expected to incorporate data from the primary literature as part of the therapeutic decision making process.

PHMY 576—Advanced Topic in Pharmaceutics (2) (Polli)

Prerequisites: PHAR 535—Pharmaceutics or concurrently enrolled in Pharmaceutics or consent of coursemaster. This course will allow students to become familiar with advanced topics in pharmaceutics. Different topics will be presented in the form of lectures, group discussions of original papers, and laboratories and will include bile acid sequestrants, drug dissolution, production methods for inhalation aerosols, metered-dose inhaler formulation, tablet compaction, pellet drug delivery, critical formulation and manufacturing variables, oral drug absorption, and novel chemical approaches for targeted drug delivery.

PHMY 577—Pharmacoeconomics (3) (Mullins)

Prerequisites: One undergraduate course in Economics or permission of instructor. This course is designed to familiarize students with the economic structure, conduct, and performance of the pharmaceutical industry. The course includes such topics as prices and profit in the industry, productivity, costs, economies of scale, innovation, economic effects of regulation, cost benefit and cost effectiveness analysis of pharmaceuticals.

PHMY 580—Drugs and Public Policy (2) (Palumbo)

An examination of public policy issues related to drug use in our society. Cases, small group discussions and outside experts will be used to analyze contemporary issues effecting pharmacy and health-care.

PHMY 581—Research Pathway Seminar (1) (Dalby/Weiner)

The objective of this course is to provide an overview of pharmaceutical and other health and life science oriented research by attending research seminars and participating in the discussion of those seminars.

PHMY 582—Advanced Patient Assessment (2) (Haines)

Prerequisites: successful completion of PHAR 541—Biopharmaceutics and Pharmacokinetics, PHAR 542—Clinical Chemistry, PHAR 554-55, 564-65—Integrated Science and Therapeutics, and PHPC 532—Longitudinal Pharmaceutical Care I or permission of coursemaster. Students will develop advanced patient assessment skills that are relevant to the provision of pharmaceutical care. At the completion of this course, the student will be able to skillfully: 1) conduct patient interviews, 2) examine patients to make diagnostic, triage and therapeutic decisions, 3) perform simple laboratory tests and 4) develop strategies to assess adherence to prescribed therapeutic regimens.

PHMY 583—Management of Health Care Systems (3) (Moore)

Prerequisites: PHAR 515—Personal Management, PHAR—523 Ethics, PHAR 545—Practice Management, PHPC 570—Community Distribution Rotation, PHPC 571—Institutional Distribution Rotation. This course will familiarize students with the different practice settings in integrated health systems ranging from community pharmacies to managed care organizations and hospitals. Areas that will be covered include pharmacy benefits management, disease state management, information management, models of integrated health systems, management of the therapeutic process, negotiating and networking, and the response of pharmacy practice settings to the changes in these systems.

PHMY 584—Patient Counseling (2) (Abramson/Beardsley)

Students will learn key information about the Top 100 prescribed drugs in the U.S. The content will focus on information that needs to be communicated to patients concerning their therapy. This material will reinforce what students have learned in other courses. In addition, students will become familiar with new product-specific material that has not been addressed in the curriculum. Periodic quizzes will assess student knowledge. The Pharmacy Practice Laboratory will also be used to videotape students as they counsel simulated patients.

PHMY 585—Perspectives of Mental Health (2) (Love)

This course provides students with an understanding of the mental health system, discusses controversies that may face the practicing pharmacist, familiarizes students with tools and techniques for studying psychopharmacologic agents and helps to define pharmacists roles in providing mental health-care.

PHMY 586—Journal Club (1) (Buterbaugh)

This elective course is abilities-based, structured in a journal club format, and parallels second year courses. The elective provides a forum in which students can practice and enhance oral and written communication skills and literature retrieval and evaluation activities while learning new information relating to ongoing required coursework. Students select articles from the primary basic or clinical research literature and lead discussions of the articles. The discussions include study design, informational content and how articles relate to and enhance the topics of second-year courses the students are concurrently taking.

PHMY 587—Special/Mammal Anatomy and Histology (2)

(Buterbaugh)

Prerequisite: PHMY 590—Fetal Pig Anatomy and/or consent of coursemaster. This advanced level elective course provides students a structured opportunity for a major dissection of two mammalian species. Students observe the location and structure of all organs of the body and their relation to each other. Working in pairs at their own pace, students systematically dissect an adult, preserved cat and a pregnant rat.

PHMY 590—Special/Fetal Pig Dissection (1) (Buterbaugh)

Prerequisite: PHAR 514—Human Biology I and/or consent of coursemaster. This elective course provides students the opportunity to dissect a mammalian species and observe the location and structure of most organs of the body and their relation to each other.

PHMY 591—Principles and Practice of Modern Compounding (2)

(Augsburger)

Prerequisites: PHAR 535—Pharmaceutics. Using a combination of lectures, problem-solving workshops and skill-building laboratories, this course teaches the appropriate extemporaneous compounding of drug preparations in pharmacies.

PHMY 592—Clinical Toxicology (2) (Klein-Schwartz)

Prerequisites: Third-year status. Note: This course is highly recommended as preparation for PHEX 551—Poison Information Rotation. The clinical toxicology course will provide students with an overview of the clinical manifestations, assessment and treatment of poisonings with common drug, chemical and biological agents. The format includes lectures by faculty and case assignments and discussions led by students. Course evaluation includes the discussion sessions, a paper on students' choice of toxicology topic, a midterm and a final exam.

PHMY 593—Care of the Terminally Ill (2) (Beardsley/McPherson)

Prerequisites: Third-year status. This course prepares students to interact with terminally ill patients through increased understanding of the social and psychological aspects of death and dying as well as the palliative pharmacotherapeutic management of these patients.

PHMY 594—Introduction to Community (2)

(Rodriguez deBittner/Fedder)

Prerequisites: PHAR 532—Longitudinal Pharmaceutical Care I. This course engages students in service-learning through work with the ENABLE Program, relating community needs in West Baltimore City to their future role as pharmacists.

PHMY 595—Herbalism (2) (Blomster)

This course explores the principles behind the botanical information and folklore uses of herbal remedies and provides an overview of alternative medicine as it is currently emerging. Alternative medicine therapies are also discussed: their rationale, safety, validity and current therapeutic use.

PHMY 596—Nonprescription Medicine (2) (McPherson)

Prerequisites: Third-year status. This course is designed to thoroughly familiarize the student with OTC medications. Emphasis will be placed on the pharmacology of these drugs, potential disease states in which the drugs will be used, self-administration techniques, consideration in selecting a product, triage issues and patient counseling.

PHMY 597—Bereavement (1) (McPherson)

This course addresses the skills and knowledge needed to serve bereaved individuals: the theory of attachment, loss and grief, as well as how to effectively interact with the bereaved.

EXPERIENTIAL ELECTIVE COURSES

The experiential elective (PHEX) courses currently offered by the School of Pharmacy are described below. In general, experiential electives can be taken for either 2 or 3 semester hours of credit. PHEX 5__ indicates the 2-hour elective while PHEX 5__A indicates the 3-hour elective. For example, a student registering for a 2-hour Parenteral Nutrition rotation would register for "PHEX 550" and "PHEX 550A" for the 3-hour rotation.

PHEX 540—Contemporary Pharmacy Practice (2, 3) (Rumrill)

PHEX 541—Bone Marrow Transport (2, 3) (Travato)

PHEX 542—Neurology (2, 3)

PHEX 550—Parenteral Nutrition (2, 3)

PHEX 551—Drug Information Clerkship (2, 3) (Mays)

PHEX 552—Poison Information (2, 3) (Anderson/Klein-Schwartz)

PHEX 559—Research (2, 3)

PHEX 560—Internal Medicine (2, 3) (Roffman)

PHEX 561—Ambulatory Care (2, 3) (Haines)

PHEX 562—Clinical Pharmacokinetics Clerkship (2, 3) (Reiss)

PHEX 563—Administration (2, 3) (Moore)

PHEX 564—Cardiology (2, 3) (Roffman)

PHEX 565—Critical Care/Shock Trauma (2, 3) (Hassan)

PHEX 566—Critical Care/MICU (2, 3) (Hassan)

PHEX 567—Diabetes Care Management (2, 3) (McPherson)

PHEX 570—Food and Drug Administration (2, 3) (Rumrill)

PHEX 571—Gastrointestinal Surgery (2, 3)

PHEX 572—Geriatric Pharmacotherapy (2, 3) (Brandt)

- PHEX 573—Home Health Care (2, 3)** (McPherson)
- PHEX 574—Infectious Disease (2, 3)** (Plaisance)
- PHEX 575—Infectious Disease/HIV (2, 3)**
- PHEX 576—Oncology (2, 3)** (Travato)
- PHEX 577—Oncology/Infectious Disease (2, 3)**
- PHEX 580—Oncology/TPN (2, 3)**
- PHEX 581—Oncology/Research (2, 3)**
- PHEX 582—Pediatrics (2, 3)**
- PHEX 583—Nuclear Pharmacy (2, 3)** (Rumrill)
- PHEX 584—Chemical Dependence Treatment (2, 3)** (Tommasello)
- PHEX 585—Chemical Dependence Research (2, 3)** (Tommasello)
- PHEX 586—Veterinary Medicine (2, 3)** (Rumrill)
- PHEX 587—Psychiatry (2, 3)** (Borovicka)
- PHEX 589—Special Studies (2, 3)** – Repeatable up to 12 credits.
- PHEX 589—SPEC/Investigational Drugs (2, 3)** (Roffman)
- PHEX 589—SPEC/Pharmacy Benefits Management (2, 3)**
- PHEX 589—SPEC/Transplant (2, 3)** (Reiss)
- PHEX 590—Community Pharmaceutical Care (2, 3)** (Haines)
- PHEX 591—Hospice (2, 3)** (McPherson)

NONTRADITIONAL PATHWAY

PHNT 500—Principles of Pharmaceutical Care (3)

This course focuses on the definitions and processes of Pharmaceutical Care and Therapeutics, including the process of therapeutic decision making. Principles of common diseases will be covered, including Oncology, Infectious Diseases and Cardiovascular Diseases. Students in this course will also learn how to provide pharmaceutical care to individual patients (e.g., develop a pharmaceutical care data base, develop a plan, and apply therapeutics principles), as well as population-based pharmaceutical care (e.g., Principles of Pharmacoeconomics, Pharmacoepidemiology and Health Education and Promotion).

PHNT 505—Prior Learning Assessment of Pharmacy Practice (2) (McPherson)

The objective of this elective course is to generate a documented compilation of a candidate's experiences and accomplishments. The Prior Learning Assessment (PLA) Portfolio will be used to grant academic credit in content areas where the student has acquired competence through non-sponsored learning. Up to 10 academic credits may be awarded through the PLA Process: two credits that parallel the Terminal Performance Objectives (applied to the Pharmaceutical Care rotation and Practice Management rotation); four credits in Practice Management; and up to four credits in Pharmacotherapy. The coursemaster welcomes the opportunity to discuss the process and likelihood of credit award with students who may be interested in this elective.

PHNT 511—Practice Management (4) (Fedder)

Practice Management is composed of four modules: Financial Management, Principles of Management, Marketing and Managing Pharmaceutical Care Services. These modules are designed to prepare students for the practice management experiential component and to build students' practice management abilities. These credits may be earned by traditional coursework, self-study or other faculty-approved modalities identified with the student advisors. When appropriate, credits in this area may be awarded through the PLA process.

PHNT 512—Principles of Pharmaceutical Sciences (2) (Hollenbeck)

This course will enable students to find, comprehend, analyze and apply current and new scientific knowledge to support pharmaceutical care by expanding their foundation in Pathophysiology, Pharmacology, Pharmaceutical Chemistry, Pharmacokinetics and Biopharmaceutics.

PHNT 520—Readiness Assessment (1) (McPherson)

This one-credit self-study course validates students' "readiness" to undertake further didactic and experiential coursework in the NTPID Pathway. The Readiness Assessment consists of two activities. The first is the successful completion of the second Module of the Drug Information Clinical Skills Series from ASHP. The

second is an objective, multiple-choice examination, assessing the content areas taught in the Therapeutics sequence. For each content area, anatomy, physiology, pathophysiology and pharmacology will be assessed. Students are expected to prepare for the Readiness Assessment through self-study. The coursemaster will suggest options for self-study such as computer-based simulation, readings, coursework or continuing education sessions or modules.

PHNT 521—Longitudinal Care (1) (McPherson)

This experiential course focuses on assessing the health status of a cohort of patients in the student's own practice, developing health status reports and participating in the management of pharmaceutical care needs of these patients during health transitions. Selected patients have health-care problems, such as congestive heart failure, AIDS, cancer or problems with aging, that are likely to result in health transitions requiring changing pharmaceutical care needs including changes in drug therapy, health education, patient counseling and physical environment (e.g., home, long term care, hospital). It is expected that students commit a minimum of approximately 45 hours (e.g., an average of about three hours per week over a semester or 1.5 hours per week over an academic year) to experiential activities in this course at their own practice site. Students are expected to apply skills from this course in subsequent Pharmaceutical Care experiential coursework.

PHNT 531—Practice Management Planning (2) (Fedder)

Practice Management Planning will focus on the application of management principles to a pharmaceutical care service. The course will provide an opportunity for the student to develop a plan defining and justifying a pharmaceutical care service and an opportunity for implementing the plan.

PHNT 532—Patient Assessment Skills (1) (Michocki)

This experiential course focuses on the skills necessary to obtain general pharmaceutical care data bases and problem-oriented data bases from patients. Acquired skills include both history-taking and physical assessment. Learning experiences include faculty demonstrations, videos, simulations and patient encounters. The course consists of 10 workshop sessions, offered on three dates. Students are expected to apply and practice skills from this course in the program's other experiential courses.

PHNT 534—Clinic or Institutional Assignment (1) (McPherson)

Activities in this course include supervised development of pharmaceutical care plans, triage decision making, discharge/ transition planning and patient counseling. Students are assigned to a total of 15 three-hour faculty-supervised pharmaceutical care sessions. Students whose area of interest is ambulatory practice are assigned to 10 three-hour Pharmacotherapy-Medication Refill Clinic sessions and five hospital-based three-hour Pharmaceutical Care Rounds sessions. Students whose area of interest is organized or institutional health-care are assigned to 10 hospital-based Pharmaceutical Care Rounds sessions and five Pharmacotherapy-Medication Refill Clinic sessions.

PHNT 536—Drug Information Experience (1) (Mays)

Pharmacists acquire and apply drug information skills in their own practice. Students will develop and attain their own drug information library, access appropriate drug information databases and utilize appropriate pharmaceutical and medical literature to prepare drug information reports. Assignments are made based upon the needs of the patients in the student's practice and the organizational needs of the practice site.

PHNT 545—Therapeutics I (3) (McPherson)

This course focuses on common disease entities and the development of pharmaceutical and other care plans for patients with these problems: pulmonary, neuro/psych, cardiovascular, endocrinology and women's health. Learning experiences include discussions of pharmacotherapy, case study analysis, adverse drug reaction analysis, discharge and transition of care planning and development of care plans. These experiences are focused on the participant's own pharmacy practice.

PHNT 546—Therapeutics II (3) (Kerr/Ives)

This course focuses on common disease entities and the development of pharmaceutical and other care plans for patients with these problems. Disease states common to the following organ systems will be covered: general care, joint disease, oncology, renal disease, gastrointestinal disease and infectious diseases. Learning experiences include discussions of pharmacotherapy, case study analysis, adverse drug reaction analysis, discharge and transition of care planning and development of care plans. These experiences are focused on the participant's own pharmacy practice.

PHNT 547—Medical Information Analysis (1) (Mays)

This course is designed to enhance student's skills in the areas of information collection, retrieval, analysis and interpretation. A variety of topics surrounding drug information will be covered including the role of informational services in health-care (including managed care programs), written and verbal communication skills, research strategy and process, drug policy management, quality assurance, ethics, careers in drug information and basic interpretation/understanding of the use of biostatistics in the medical literature. At the conclusion of this course, students will be able to: 1) retrieve medical literature depending appropriate to the request, 2) evaluate the medical literature and draw conclusions necessary to make effective patient interventions/therapeutic decisions and 3) concisely present clinical findings and answer questions about recent medical advances. Students will interact with both their peers and faculty during this course in order to fulfill all learning objectives.

PHNT 570—Pharmaceutical Care Experience (3) (McPherson)

This course is designed to help practicing pharmacists build the skills needed to deliver pharmaceutical care services to patients. Students develop and implement Triage Plans, Pharmaceutical Care Plans and Transition Plans for a cohort of patients (in addition to the patients accumulated during the Longitudinal Care

experience) in their own practice. Patients selected for plan development and implementation must have at least two pharmaceutical care or pharmacotherapy problems. Students communicate these plans to other health-care professionals, monitor the response of patients to these plans, make any necessary modifications and assess patients' health outcomes of the plans. Students are expected to commit a minimum of 180 hours (an average of about six hours per week over two semesters) to activities related to this course. During this course, students will be accountable for application of pharmacotherapy topics acquired through Prior Learning Assessment and the didactic Pharmacotherapeutics course. Students completing this course will demonstrate the Nontraditional Pathway's terminal performance objectives related to implementation of pharmaceutical care services in their practice site.

TO REACH THE CAMPUS

The University is located in downtown Baltimore, six blocks west of the Inner Harbor and two blocks north of Oriole Park at Camden Yards in the University district.

Directions

From I-95: Take I-395 (downtown Baltimore) and exit onto Martin Luther King Jr. Blvd., staying in right lane. At fourth traffic light, turn right onto Baltimore Street. Turn left at second traffic light onto Paca Street (get into right lane) and enter the Baltimore Grand Garage (on your right).

Bus

MTA routes 1, 2, 7, 8, 11, 20, 35 and 36 serve the campus.

Subway

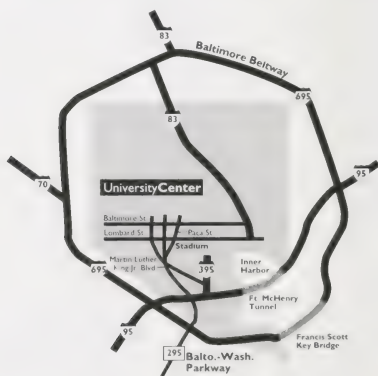
The Baltimore Metro runs between Charles Center and Owings Mills. Stops nearest the University are at Lexington Market and Charles Center.

Light Rail

Light rail connects park and ride locations in northern Baltimore County and Oriole Park at Camden Yards, then continues south to Glen Burnie. The University stop is two blocks east of campus on Baltimore Street.

Train

MARC commuter service runs from Camden Station, 301 W. Camden Street.



University of Maryland Baltimore



- MSH Mid School Teaching Facility
680 W Baltimore St. H2
- NSM National Museum of Dentistry
31 N Calverton St. E
- NS Nursing School
655 W Lombard St. K2
- PR Prichard Room
481-488 W Lexington St. D5
- RS Rosemary School
20 N Pine St. G2
- PSN Police Station
218 N Pine St. G2
- RMH Royal Medical Hall
655 W Lexington St. D5
- SSW School of Social Work
525 W Redwood St. I
- SMH Nat. Med. Examiners Bldg.
11 Pine St. I1
- UMMS University of Maryland Medical System
22 N Calverton St. H5
- UP University Plaza
Redwood St. G2-H7
- USP University Sports Bldg.
118 Pine St. H1
- VAM Veterans Affairs Medical Center
19 N Greene St. F5
- WMH Westminster Hall
570 W Fayette St. I
- WH Western Health Center
700 W Lombard St. L5
- WPC Walter P. Reuther Center
620 W Fayette St. L1
- 298P 298 Pine St. P9
- 405R 405 W Redwood St. Bldg. H
- 502P 502 W Fayette St. Bldg. L5
- 901P 901 W Pratt St. Bldg. M3

- Parking Locations**
- BGA Baltimore Grand Garage (visitors) F9
 - DPP Dental Patient Parking Lot F4
 - KI *Kaiser Tower B4, C4, C5
 - LEX Lexington Garage (students) C3
 - PG *Pearl Garage D5
 - PO Parking Office E5
 - PNS *Penn St Garage (visitors) I1
 - PRG *Pratt St Garage L5
 - UP University Plaza Garage (patients) H7
 - P Public parking facilities
 - *Assigned University parking

- Orientation and Civic Facilities**
- BRM Baltimore-Rosemont Bldg. (Biophysics) M5
 - LM Lexington Garage (students) C3
 - MBPO Market Office (Public Office) D6
 - OSPC Oriole Sports Center II
 - OP Oriole Park at Camden Yards P9

- Academics and Medical Facilities**
- | | | | |
|---|---|---|--|
| AR Administration Bldg.
570 W Lombard St. K2 | DN Dental School
660 W Baltimore St. L5 | EH East Hall
520 W Lombard St. J1 | EH Hospital
690 W Lexington St. G1 |
| MHR Allied Health Bldg.
100 Pine St. E1 | EH1 Education Center Health Sciences Bldg.
700 W Lombard St. J2 | EN1 Engineering Building
16 N Calverton St. E | HH1 Howard Hall
600 W Redwood St. H5 |
| M Athletic Center Pratt St Garage L4 | GH1 Graduate Center Bldg.
29 N Calverton St. E | IB Lombard Building
515 W Calverton St. F | IN1 Information Services Bldg.
600 N Calverton St. E |
| BD Baltimore Dispensary
100 N Pine St. E5 | HGB Homer Gudelsky Building
Lombard & Greene Sts. J1 | MBC M3 Bar Center
520 W Fayette St. E7 | INM1 Information Services Bldg.
600 N Calverton St. E |
| BRB Brezler-Rosemont Bldg. Med School
685 W Baltimore St. H5 | HSE Health Sciences East
685 W Baltimore St. H3 | MIEMSS MD Inst for Emergency Med Svcs Sys
600 W Pratt St. A1 | LB Lombard Building
515 W Calverton St. F |
| BSI Baltimore Student Union
620 W Lombard St. K3 | HSHSI Health Sciences and Human Services Bldg.
600 W Lexington St. E | MBIO Med Biotechnology Ctr
721 W Lombard St. K2 | LS1 Law School Library
800 W Baltimore St. G1 |
| CT Curran Bldg.
500 W Fayette St. E8 | | | LSM1 Law School
Marshall Law Library
111 S Calverton St. K |

NOTES

Student Right-to-Know and Campus Security Act Request

The Student Right-to-Know and Campus Security Act (Public Law 101-542), signed into federal law November 8, 1990, requires that the University of Maryland make readily available to its students and prospective students the information listed below.

To obtain any of this information, please check the appropriate space(s), fill in your name, mailing address and UM school and program name, tear off this form and send it to:

Office of Student Services
Attention: Student Right-to-Know Request
University of Maryland
621 W. Lombard St., Room 302
Baltimore, MD 21201

Complete and return this portion

- Financial Aid
- Costs of Attending the University of Maryland
- Refund Policy
- Facilities and Services for Students with Disabilities
- Procedures for Review of School and Campus Accreditation
- Completion and Graduation Rates for Undergraduate Students
- Loan Deferral Under the Peace Corps and Domestic Volunteer Services Act
- Campus Safety and Security
- Campus Crime Statistics
- Student Sexual Orientation Nondiscrimination

Name _____

Address _____

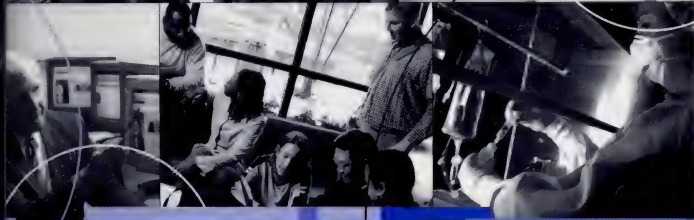
UM school and program _____







University of Maryland
School of Pharmacy
20 N. Pine St.
Baltimore, MD 21201
410-706-7653 • 800-852-2988
www.pharmacy.umaryland.edu



University of Maryland **School of Pharmacy**

2001–2003 Catalog



2001–2003 Catalog
Doctor of Pharmacy (PharmD) Program
Pharmaceutical Health Services Research Doctor of Philosophy (PhD) Program
Pharmaceutical Sciences Doctor of Philosophy (PhD) Program

School of Pharmacy
University of Maryland
20 N. Pine St.
Baltimore, MD 21201-1180

Program Information:

PharmD Admissions Office 410-706-7653
or 800-852-2988 (Toll Free)

E-mail: PharmDhelp@rx.umaryland.edu

Nontraditional Pathway Information 410-706-0761

**Pharmaceutical Health Services Research
(PhD) Program** 410-706-0879

Pharmaceutical Sciences (PhD) Program 410-706-0549

Dean's Office 410-706-7650

University Financial Aid Office 410-706-7347

External Affairs 410-706-5893

Web site www.pharmacy.umaryland.edu

The University of Maryland is accredited by the Middle States Association of Colleges and Schools. The School of Pharmacy's Doctor of Pharmacy (PharmD) and continuing education programs are accredited by the American Council on Pharmaceutical Education. For additional information, write ACPE, 311 W. Superior St., Chicago, IL 60610 or call 312-664-3575. The School is a member of the American Association of Colleges of Pharmacy.

The School reserves the right to make changes in requirements for admission, curriculum, standards for advancement and graduation, fees, and rules and regulations.

The University of Maryland School of Pharmacy is committed to providing equal education and employment opportunity in all of its programs.

The University and the School of Pharmacy do not discriminate on the basis of race, color, religion, age, ancestry or national origin, gender, sexual orientation, physical or mental disability, marital status, or veteran status. Exceptions are as allowed by law, for example, due to bona fide occupational qualifications or lack of reasonable accommodations for disabilities.

Produced by the University of Maryland Office of External Affairs, 2001.

2001–2003 Catalog

University of Maryland
School of Pharmacy



Message from the Dean

Dear Students and Colleagues:

Health care delivery in today's society continues to be transformed. New medical technologies, new drugs, and new drug delivery systems are paving the way to a healthier world. Patients, who once had little say in their own health care, now have a desire to better understand their medical conditions and their medications. And pharmacists—whether in community or hospital practice, the pharmaceutical industry, government, or nonprofit organization—are playing major roles in developing new and innovative medicines, managing patient drug therapy, and helping patients to better understand how to use their medicines.

Pharmacy has adapted to meet the demands of the changing health care delivery system. Pharmacists are committed to the goal of helping patients achieve desired outcomes from their medication therapy that lead to improvement in quality of life. Pharmacists play an active part in achieving this goal by contributing their expertise in many ways.

The University of Maryland School of Pharmacy has developed a Doctor of Pharmacy curriculum that emphasizes problem solving and critical thinking. While content is critically important and essential to education, it changes rapidly. Our students rapidly recognize that learning to learn and committing to a lifetime of learning are the most important outcomes of pharmaceutical education at Maryland.



Maryland students learn to practice as patient-oriented health care providers who can work as part of a multi-professional health care team. The curriculum is innovative and incorporates flexibility in course structure. Students have substantial opportunities to choose electives, pathways offering avenues for concentration within areas of interest, and varied time frames for coursework. To round out their education, potential pharmacists can select practice experience from hundreds of experiential learning sites throughout the region.

The mission of the University of Maryland School of Pharmacy is to improve the health and well being of people through excellence in pharmaceutical education, research and scholarship, pharmaceutical care, and public service. In addition to our Doctor of Pharmacy program, the School offers graduate programs in Pharmaceutical Health Services Research and in Pharmaceutical Sciences that prepare students for careers in research and policy.

It is our vision that the School of Pharmacy be recognized as an international leader in innovation and excellence in education, scholarship, pharmaceutical care, and public service. We strive to:

- attract and mentor students to attain their fullest potential.
- recruit and develop faculty members to serve as exemplary role models.
- foster an environment for learning and productivity that will guarantee the fullest contributions of a diverse faculty, staff, and student body.
- collaborate with partners both within and outside the University to achieve this vision.

This catalog serves as a starting point and a reference for information about the School of Pharmacy. Our Web site, at www.pharmacy.umaryland.edu, provides additional information as well as current news about the School of Pharmacy. Thank you for your interest in the University of Maryland School of Pharmacy.

David A. Knapp, PhD

Dean

University of Maryland School of Pharmacy



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The School of Pharmacy

HISTORY

The University of Maryland School of Pharmacy has a rich and distinguished heritage. First incorporated as the Maryland College of Pharmacy on January 27, 1841, it is the oldest pharmacy school in the South and the fourth oldest in the country. Primarily an independent institution until 1904, the Maryland College of Pharmacy then became the Department of Pharmacy of the University of Maryland. In 1920, the University of Maryland in Baltimore merged with the Maryland State College at College Park to form the State University. Today, the School of Pharmacy is one of six professional schools and a graduate school that comprise the University of Maryland in downtown Baltimore.

Throughout its history, the School of Pharmacy has been a local and national leader for the profession of pharmacy. It was a founding member of the American Association of Colleges of Pharmacy, the professional organization established to formulate uniform standards for the graduation of pharmacy students. The School was also instrumental in the formation of the American Council for Pharmaceutical Education, the national accreditation organization for schools of pharmacy.

In 1970, through the efforts of the School and the Maryland Board of Pharmacy, Maryland became the first state to replace unstructured internships with a professional-experience program incorporated in the School's curriculum, setting a national standard for professional pharmacy education. In 1980, Maryland became the first School of Pharmacy to establish a Center for the Study of Pharmacy and Therapeutics for the Elderly, now the national model for pharmacy geriatric education. In 1993, Maryland again set a benchmark for the nation by implementing a pace-setting Doctor of Pharmacy (PharmD) program.

MISSION

The mission of the University of Maryland School of Pharmacy is to improve the health and well being of the citizens of Maryland and beyond, through excellence in pharmaceutical education, scholarship, pharmaceutical care, and public service.

VISION

- The University of Maryland School of Pharmacy will be recognized as an international leader in innovation and excellence in education, scholarship, pharmaceutical care, and public service.
- We will attract and mentor students to attain their fullest potential.

- We will recruit and develop faculty to serve as exemplary role models.
- We will foster an environment for learning and productivity that will guarantee the fullest contributions of a diverse faculty, staff, and student body.
- We will collaborate with partners both within and outside the University to achieve this vision.

COMMITMENT TO DIVERSITY

The School seeks an applicant pool and a student body that is diverse in terms of race, sex, age, geographic and economic background, religion, and ethnicity. The 2001 enrollment statistics reflect the diversity of the student body: 45% Caucasian, 27% Asian, 19% African-American, 7% International, 1% Hispanic, and less than 1% Native-American.

COMPLIANCE WITH ADA LEGISLATION

In accordance with the Americans with Disabilities Act of 1990, the School examines all aspects of its programs and services to ensure accessibility to qualified students with disabilities. From recruitment to commencement, the School strives to create an environment that respects individual differences while challenging students to perform to their optimal ability. Modifications tailored to the needs of the diverse student population include applications, brochures, course materials and examinations offered in alternate formats, and modified lengths of time to complete degree requirements. Equally important, the administration reviews organizational activities that would prohibit participation by students with disabilities and provides services for these students to ensure their rights and protection under the law. With increased use of computer technology, the School makes information more accessible and is better able to serve students with disabilities.

ADMINISTRATIVE OFFICES

ACADEMIC AFFAIRS

The Office of Academic Affairs provides leadership and administrative management for instructional resources used in all professional education programs. The associate dean for academic affairs is responsible for curriculum, scheduling, graduate programs, graduate teaching assistants, liaison with other academic units of the University, continuing education, the Office of Experiential Learning, the Nontraditional PharmD Pathway, and review of research proposals. The director of continuation studies, the director of educational technology, and the

director of experiential learning assist this office. The associate dean for academic affairs meets with the Educational Advisory Committee, composed of members of the external professional pharmacy community, to identify and discuss important issues affecting the educational programs at the School and to provide advice on those issues. Also, this associate dean coordinates initiatives in the international arena that deal with education and research.

FINANCE AND ADMINISTRATION

The Finance and Administration Office is directed by the associate dean who is also the chief financial officer for the School. The office provides leadership and oversight of support services necessary for the School to carry out its mission. The following units and positions are part of the team that helps deliver support services: Facilities and Laboratory Support Services, Computer and Network Services, the Business Office, Operations Manager, and the Senior Staff Team.

EXTERNAL AFFAIRS

The Office of External Affairs is responsible for the areas of development (fund raising) and alumni/constituent relations for the School of Pharmacy. Currently, the office is focused on the campus-wide Invest in Excellence capital campaign. Pharmacy's share of this effort is \$6 million and carries the theme Pharmacy for a New Century, with an emphasis on new buildings and student and faculty support. Working closely with the dean, the Board of Visitors, alumni, faculty, and staff, the development staff seeks philanthropic support from individuals, corporations, and foundations.

Alumni/constituent relations plans class reunions and other alumni events to promote the School to its many constituencies. The office provides leadership to the Alumni Association, a dedicated group of graduates who assist with student recruitment, engage in grassroots advocacy on behalf of the School, and host the annual graduation banquet each spring.

STUDENT AFFAIRS

The Office of Student Affairs provides a variety of services to enhance the student learning experience and to provide support to students during their academic career. The School's student affairs system is under the direction of the associate dean for student affairs and the director of student services. The office includes a coordinator of recruitment and admissions along with three professional staff. The office is responsible for recruitment, admission, academic progression, and graduation of PharmD students and is involved with veteran affairs, financial aid, student leadership development, and counseling programs. Other services

include personal counseling, advising and tutoring systems, career development, and special programs, such as the Open House and high school mentoring programs.

The office monitors the activities of the School's student organizations that operate under the Student Government Association (SGA) umbrella. The SGA, as well as each organization, has a faculty advisor who assists in planning and organizing the group. The SGA holds biweekly meetings and arranges an impressive array of activities.

The School's Student Discipline and Grievance Committee handles issues surrounding academic integrity and student behavior. The Student Affairs Committee addresses academic issues. Both of these committees are composed of students and members of the faculty and Office of Student Affairs. The office coordinates an extensive career development program for PharmD students and attempts to increase student awareness of job opportunities in light of health care reform.

LECTURE SERIES

The School supplements its regular curriculum with the following special lectures and symposia:

Francis S. Balassone Memorial Lecture. The Maryland Pharmacists Association, the School of Pharmacy Alumni Association, and the School sponsor this lectureship as a memorial to Francis S. Balassone. He was a 1940 graduate of the School, a past president of the Alumni Association, a distinguished former faculty member, and a past president of the National Association of Boards of Pharmacy.

Andrew G. DuMez Memorial Lecture. This lectureship was established in 1969 by Mrs. DuMez in memory of her husband, Dr. Andrew G. DuMez. Dean of the School of Pharmacy from 1926 to 1948, Dr. DuMez was a distinguished educator and leader in pharmacy in Maryland, the United States, and around the world.

Ellis Grollman Lecture in Pharmaceutical Sciences. Mrs. Evelyn Grollman Glick funded a lecture program in memory of her brother, Ellis Grollman, in 1983. He was a 1926 graduate of the School. Each year a nationally recognized researcher in the pharmaceutical or related basic sciences is invited to present this lecture.

Peter P. Lamy Lecture. The Peter P. Lamy Lecture was inaugurated in 1992 in recognition of Dr. Lamy's career as an internationally recognized authority on geriatrics and gerontology. This lecture provides an opportunity for pharmacists to discuss critical issues in the care of the nation's elderly.

Dean's Colloquium. The Dean's Colloquium brings together students, faculty members, and nationally recognized scientists and clinicians to discuss contemporary issues of relevance to pharmacy and health care. These seminars provide unusual opportunities for interaction and exchange of new information on topics related to pharmacy practice and science.

ENDOWED CHAIRS

The School has the following endowed chairs:

The **Emerson Professorship in Pharmacology** was endowed in 1927 as a chair in Biological Testing and Assay by Captain Isaac Emerson, president of the Emerson Drug Company. The first chair was filled by Dr. Marvin Thompson, a pharmacologist at the Food and Drug Administration at the time. Dr. Clifford W. Chapman, a pharmacologist from the Canadian National Laboratories, was appointed to the chair in 1938. Dr. Casimer Ichniowski and Dr. Naim Khazan were the third and fourth appointees to the chair. In 1988, Dr. Gerald M. Rosen was appointed Emerson Professor. His appointment as Emerson Professor led to Dr. Rosen being named an Eminent Scholar by the Maryland Higher Education Commission.

The **Parke-Davis Chair in Geriatric Pharmacotherapy** was established in 1990 with a \$1 million gift from the Warner-Lambert Co. on the eve of the 125th anniversary of Parke-Davis and the School of Pharmacy's 150th Anniversary. The endowment underwrites the School's continuing commitment to geriatric pharmacotherapy as exemplified by the accomplishments of the late Peter P. Lamy, the first holder of the Parke-Davis Chair. Dr. Bruce C. Stuart is current holder of this chair.

The **Ralph Shangraw Endowed Chair in Pharmaceutical Sciences** was established in June 1995 by Colorcon and the University of Maryland School of Pharmacy in honor of the retirement of Ralph Shangraw. The endowment will be used to support a Professorship in Pharmaceutical Sciences until the fund has reached full funding and then will support an endowed chair.

CENTERS AND RESOURCE PROGRAMS

The **Biomedical Chemistry NMR Center** houses a GE 300 MHz nuclear magnetic resonance spectrometer. The superconducting magnet, the heart of the instrument, is permanently immersed in a vacuum-jacketed reservoir of liquid helium (-260°C) and allows the detection and accurate determination of protons, ^{13}C , ^{31}P and other nuclei of biological importance. The NMR was the first instrument of its kind on campus, and it opened up many new avenues of research within the School, greatly increasing the number of inter-school collaborative ventures.

The **Center on Drugs and Public Policy** contributes to informed debate of drug policy issues in our society. CDPP research and educational programming has provided thought-provoking analysis and focused dialogue on drug use and public policy since 1987. The CDPP specializes in providing credible, unbiased, and pragmatic solutions for government agencies, the pharmaceutical industry, professional organizations, and private businesses on public health issues and practices involving medication use and regulatory matters.

The **Drug Information Center** provides comprehensive medical information to contract affiliated institutions and the general public. The provision of service

includes, but is not limited to, patient-specific and adverse drug reaction consultations, guidelines for use, formulary monograph/review preparation and management, and newsletter support. The UMDI and its staff are also charged with the education of UMB pharmacy students in the practice of medical literature analysis. Students are educated on the proper utilization of online databases and search strategies in the hope of making them more proficient in the assimilation of information. The UMDI also participates in an ongoing Internet Drug Information Service, which provides online users the ability to submit questions to qualified pharmacy staff. These questions are not limited in any way to geographic region or subject. The UMDI answers each question on an individual basis, usually within three business days, many within hours.

The **ENABLE** (Enhancing Neighborhood Action By Local Empowerment) Program trains community health workers to assist patients in maintaining control of chronic disease states over time. It is funded through state and federal funds and is part of the AmeriCorps program.

The **Peter Lamy Center on Drug Therapy and Aging** serves as the focal point of all of the School's geriatric education, service, and research activities. It provides continuing education programs both on the state and national levels. Funding from federal and private sources allows the center to foster relevant research by faculty members and graduate students from all School departments. The center is administratively responsible for the Elder-Health Program, which informs pharmacy students and retired pharmacists about the social and psychological aspects of drug use among the elderly, as well as the therapeutic goals of treatment for prescribed and over-the-counter medications. The students and retirees use the knowledge to give presentations to elderly members of the community.

The **Maryland Poison Center** has been a service program of the University of Maryland School of Pharmacy since 1972. The service has grown and changed quite a bit over the years. During its first year, the Maryland Poison Center received 5,600 calls. In 1998, the center fielded more than 60,000 calls. Despite the increase in call volume, the center's commitment to providing the best quality poison triage, treatment, education, and prevention services has never changed.

The Maryland Poison Center is certified by the American Association of Poison Control Centers (AAPCC) as a regional poison center providing poisoning triage, treatment, education, and prevention services to all Marylanders. This service is staffed by pharmacists and nurses who have specialized clinical toxicology training 24 hours a day, every day of the year. All of the specialists have been certified by the AAPCC as specialists in poison information. On average, each specialist has over six years of experience managing poisoning and overdose cases. In addition to the knowledge, skill, and experience of the poison specialists, the director of the program is board certified in clinical toxicology and the medical director is boarded in emergency medicine as well as in medical toxicology and additional specialized consultants.

The **Mental Health Program** of the School of Pharmacy is a joint venture with the Developmental Disabilities Administration and Mental Hygiene Administration of the state of Maryland. Its primary goal is to upgrade all aspects

of pharmacy practice within the state's mental health facilities. The program also serves as a site for pharmacologic and administrative research in mental health, a testing ground for the development of innovative strategies in mental health pharmacy practice, and a training resource for mental-health-related issues. Members of the School's faculty serve at nine mental health sites around the state.

The **Office of Substance Abuse Studies** was created in 1986 at the University of Maryland School of Pharmacy. OSAS has been and continues to be committed to the development and distribution of information on substance abuse. In addition, it is actively involved in several areas of substance abuse research. OSAS has created and supervises numerous programs that focus on prevention and treatment, as well as investigation of the dynamics of substance abuse. OSAS goals and activities: 1) provide information and education about substance abuse and its treatment to health care professionals; 2) prevent substance abuse through community service programs; and 3) design and implement research on substance abuse and chemical dependence.

University Pharmaceuticals of Maryland, Inc. (UPM) is a resource partner for the pharmaceutical industry. UPM provides high-quality drug formulation and manufacturing services at competitive prices. The company offers a complement of technical and value-added services with one principle objective in mind—to rapidly advance pharmaceutical technologies and products on behalf of our clients and alliance partners. Services include pre-formulation and formulation development, drug and excipient analysis and testing, GMP manufacture of clinical supplies, bioequivalence and bioavailability studies, distance learning, customized training programs, forums and continuing education, manufacturing process design and optimization, critical variables analysis, and regulatory guidance.

FACILITIES

The School of Pharmacy has the following facilities located at various sites across campus:

The School moved to **Pharmacy Hall**, a seven-story facility on Pine Street, in 1982. Situated at the west entrance to the campus, Pharmacy Hall houses classrooms and lecture facilities, research laboratories, conference rooms and administrative offices for the School of Pharmacy. Pharmacy Hall also houses a GMP (Good Manufacturing Practices) facility capable of producing drugs for human consumption. Some members of the Department of Pharmacy Practice and Science are located two blocks away in the five-story **Allied Health Building**, which opened in 1992. Located at 100 Penn St., it is diagonally across from the Maryland Pharmacists Association offices in the Kelly Building at 650 W. Lombard St. School staff and faculty members are also located in the **Century Building**, 506 W. Fayette St., **Greene Street Building**, 100 N. Greene St.; and the **University of Maryland Biotechnology Institute** on Lombard Street.

The **Pharmacy Learning Center**, opened in 1999, houses teaching laboratories, student computer facilities, a lecture hall, classrooms, seminar rooms, a student lounge, a facility for Web-based instructional development, and faculty offices. The building, located at 110 N. Pine St. is wired for Internet access. Projection systems enable presenters to make PowerPoint presentations and utilize Web sites in their lectures.

Pharmacy **Computing and Network Services** is responsible for the maintenance of the School of Pharmacy's computer system and network. Computing and Network Services is located at 110 N. Pine St., Room 127. The School's switched Ethernet (connected via a Cisco Catalyst 5505) network spans five separate buildings—Pharmacy Hall, Allied Health, Century Building, 100 N. Greene St., and the new Pharmacy Learning Center—totaling 300-plus nodes. The connection with the campus is a 100 Mbit full-duplex link to the campus Cisco 7513 router as are the connections between the School's five buildings. The School runs most of its applications off of Novell NetWare 5 file servers but also uses Windows NT servers for a variety of applications, including the School's developing intranet using the School's NDS tree. In addition, the department maintains the School's PCs, including Macs and the Silicon Graphics Indy, which acts as the School's primary Web server.

The **Computational Chemistry Laboratory** is used for the study of biochemical systems via mathematical models. The goal of these studies is to better understand the relationship of the three-dimensional structure and dynamics of biological molecules to their physiological function. Such knowledge allows for a detailed analysis of the molecular basis of disease, a rational basis for the design of therapeutic agents. These approaches greatly increase the efficiency of the drug-discovery process and can lead to significant savings of time and money, which may ultimately be passed on to the consumer.

The **Department of Pharmaceutical Sciences facilities** are equipped with modern chemical instrumentation, including ultraviolet-visible spectrometers, a Fourier-transform infrared spectrometer, a 300-MHZ NMR spectrometer, several mass spectrometers, gas and high-performance liquid chromatography system, radioactivity counters, high-speed centrifuges, and molecular modeling workstations. Laboratories provide facilities for conducting research in organic synthesis, microbiology, natural products, molecular biology, fermentation, enzymology, drug metabolism, computational chemistry, and molecular modeling. The department also has one of the most modern industrial and pharmaceutical technology research and manufacturing facilities in the country. It has small-scale and pilot-scale equipment for the production of liquid, semi-solid, parenteral aerosols and solid dosage forms. There is also a state-of-the art analytical facility, which is a focal point for basic and applied pharmacokinetic research and which plays a major role in enabling faculty members to conduct clinical research in hospitalized patients. The laboratory is equipped to handle all phases of a drug's absorption and disposition in animals and/or humans. A Good Manufacturing Practice facility has also been established in the School.

STUDENT HONORS AND AWARDS

The School recognizes academic excellence during the fall and spring honors convocation. During the fall ceremony, students receive academic achievement awards in all classes, based on performance the preceding year. The School also recognizes leaders of student organizations at this time. The Rho Chi Honor Society presents its annual book award to the student(s) having the highest academic GPA. The society also awards certificates to students with GPAs above 3.25.

In the spring, the School honors its graduates. Those in the top tenth of the class graduate with *high honors* and those in the second tenth of the class graduate with *honors*. Faculty members present the following academic-achievement awards to members of the graduating class at the spring Graduation Honors Convocation.

Alpha Zeta Omega Fraternity Prize, Kappa Chapter. The Kappa Chapter of the Maryland Alumni Chapter of the Alpha Zeta Omega fraternity provides a prize that is awarded to a student for proficiency in pharmacology.

Andrew G. DuMez Award. In memory of Dr. Andrew G. DuMez, former dean and professor of pharmacy, Mrs. DuMez provides a gold medal, awarded to a student for superior proficiency in pharmacy.

Lambda Kappa Sigma-Cole Award, Epsilon Alumnae Chapter. A student receives this award in memory of Dr. B. Olive Cole, former acting dean, for proficiency in pharmacy administration.

The Excellence in Pharmaceutical Care Award. The Nontraditional PharmD Pathway preceptors and mentors give this award to a student who has excelled in his/her practice setting.

School of Pharmacy Gold Medal of General Excellence. The students who receive this award have attained the highest general average in the entry-level program and in the Nontraditional PharmD Pathway.

William Simon Memorial Prize. In honor of the late Dr. William Simon, a professor of chemistry in the School for 30 years, a student is awarded a gold medal for superior work in the field of biomedical chemistry.

Frank J. Slama Award from the School's Alumni Association. In tribute to Dr. Frank J. Slama, Class of 1924, a former professor and head of the Department of Pharmacognosy, for over half a century of loyalty and service to his profession, to the School, and to the Alumni Association, the School's Alumni Association gives this award to a member of the graduating class who excelled in extracurricular activities.

Dr. and Mrs. Frank J. Slama Scholarship Fund. In memory of her husband, Dr. Frank J. Slama, former distinguished professor in the School of Pharmacy, Lillian Slama established this scholarship on August 12, 1975. A student receives this award for superior work in the field of biopharmacognosy.

Wagner Pharmaceutical Jurisprudence Prize. In memory of her husband, Manuel B. Wagner, and her son, Howard J. Wagner, both alumni of the School, the late Mrs. Sadie S. Wagner, and her daughter, Mrs. Phyllis Wagner Brill Snyder, fund a prize to a graduating student for meritorious academic achievement in pharmaceutical jurisprudence.

John F. Wannewetsch Memorial Prize. In memory of her brother, Dr. John F. Wannewetsch, a distinguished alumnus of the School, Mrs. Mary H. Wannewetsch funds a prize given to a graduating student who has exhibited exceptional performance and promise in the practice of community pharmacy.

The Conrad L. Wich Pharmacognosy Prize. In appreciation of the assistance that the Maryland College of Pharmacy extended to him as a young man, Mr. Conrad L. Wich provided a fund. The faculty assembly awards annually the income from this fund to a student who has done exceptional work throughout the course in pharmacognosy.

L.S. Williams Practical Pharmacy Prize. A bequest provided by the late L.S. Williams funds the L.S. Williams Practical Pharmacy Prize given to the student having the highest general average throughout the course in basic and applied pharmaceutics.

STUDENT ORGANIZATIONS

The School has 18 student organizations. The organizations include fraternities, professional pharmacy organizations, an honor society, high school tutoring/mentoring, and social organizations that perform a variety of services and activities for the profession and the community. The PharmD student organizations operate under the auspices of the Student Government Association. See the list of student organizations at www.pharmacy.umaryland.edu.

PHARMD STUDENT GOVERNMENT ASSOCIATION

The School's Student Government Association coordinates the student government activities. Through its officers and committees, the SGA sponsors numerous social, service, and educational events. All professional pharmacy students belong to the SGA. The executive committee of the SGA includes the presidents of all school organizations. This committee meets periodically with School administrators to discuss important issues. At the campus level, the University Student Government Association coordinates the activities of the graduate school and the six professional schools. USGA representatives are elected by the students of all seven schools.

PHARMACY GRADUATE STUDENT ASSOCIATION

The purpose of the Pharmacy Graduate Student Association (PGSA) of the University of Maryland School of Pharmacy is: 1) to act as an official liaison body to communicate graduate student concerns to the pharmaceutical sciences and pharmacy administration officials of the School; 2) to provide a platform for discussions and suggestions on matters involving graduate students; 3) to communicate and support research interests of graduate students of the School;

4) to promote efficient recruitment and orientation of incoming graduate students; 5) to promote a better graduate student life; 6) to represent the interests of graduate students as members of campus-wide organizations; and 7) to recognize, foster, and reward outstanding leadership among individuals who promote PGSA ideals.

ALUMNI ASSOCIATION

The mission of the School of Pharmacy Alumni Association is to strengthen and enhance the School by fostering communications, social interactions, and a sense of pride in the School. Each year, the association sponsors a spring banquet honoring the graduating class and the 50-year class. The association also awards eight need-based scholarships to deserving students. The association also plays a leadership role in the School's fund-raising activities. For example, many members participate in the annual phone-a-thon and are generous donors to the David Stewart Associates, the major giving club for alumni, friends, and faculty members who contribute \$1,000 or more annually to the School.



Stanley Pyles, BSP, (left) teaches a student in a community pharmacy.

The University of Maryland

The University of Maryland, located in downtown Baltimore, is the founding campus of Maryland's public university system and a thriving center of life sciences research and community service. The six professional schools and a graduate school are dedicated to excellence in professional and graduate education, research, public service, and patient care.

With \$255 million in sponsored activities for Fiscal Year 2001, the University uses state-of-the-art technological support to educate leaders in health care delivery, biomedical science, social services, and law. The campus fosters economic development in the state by conducting internationally recognized research to cure disease and to improve the health, social functioning, and just treatment of the people served. The University is committed to ensuring that the knowledge it generates provides maximum benefit to society, directly enhancing the community.

HEALTH SCIENCES AND HUMAN SERVICES LIBRARY

The Health Sciences and Human Services Library (HS/HSL) and the Thurgood Marshall Law Library are the central libraries on the University's campus. The HS/HSL is distinguished as the first library established, in 1813, by a medical school in the United States, and it is a national model of state-of-the-art information technology. The HS/HSL is the regional medical library for 10 southeastern states, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands as part of the National Network of Libraries of Medicine.

Located at 601 W. Lombard St., the HS/HSL is designed to centralize library and computing resources. One of the dominant architectural features of the library is a six-story tower located at the northeast corner of the building. Other features include a 30-workstation microcomputer teaching lab, a ceremonial room on the top floor of the tower, and floor-to-ceiling windows with a view of historic Davidge Hall.

Collections, including audiovisuals, are located in selected professional schools. These special collections are located in the School of Medicine Learning Resources Center, Woodward VA Hospital Library, Dental School Independent Learning Center, School of Nursing Media Center, and Law School Media Services Library.

Serving all schools on campus and the University of Maryland Medical System, the library contains more than 338,477 volumes, including over 2,319 periodicals. It is among the 25 largest health sciences libraries in the country.

In addition to traditional services, such as reference support and interlibrary loan, the HS/HSL offers an array of services. For more information, call 410-706-7996 or visit the HS/HSL home page at www.hshsl.umaryland.edu.

STUDENT AND EMPLOYEE HEALTH

Student and Employee Health provides comprehensive health care to students. The office is located at the University Family Practice, 29 S. Paca St. Staffed by family physicians and nurse practitioners, the office is open Monday, Tuesday, and Thursday, from 8 a.m. to 7 p.m., and Wednesday and Friday, from 8 a.m. to 4:30 p.m.

Patients are generally seen by appointment (by calling 410-328-6645), although true emergencies can be seen on a walk-in basis. Doctors on call can be reached at 410-328-8792. The doctor on call will arrange for examination and care of students needing after-hours care.

Gynecological services, including health maintenance (Pap smears, etc.), family planning, and routine procedures, are provided by either the family physicians or the nurse practitioners. Birth control pills are available at a reduced cost for students receiving their GYN care through Student and Employee Health. Students' families also may receive care at this office through Family Medicine Associates, the clinical practice of the School of Medicine's Department of Family Medicine. For an appointment, call 410-328-6645; for information, call 410-328-8792.

All full-time students must have health insurance. An insurance policy providing wide coverage, including obstetrical care, is available through the University. The cost of most of the care provided at Student and Employee Health is covered largely by the student health fee.

Hepatitis B is an occupational illness for health care providers. It has serious consequences and can even be fatal. Immunization against Hepatitis B is required for pharmacy, medical, medical technology, dental, dental hygiene, and nursing students. The series of three immunizations is given through Student and Employee Health.

The staff of Student and Employee Health maintain strict confidentiality; no medical or other information is given to any source without the student's written permission. Students are required to provide documentation that they have received immunization against several diseases. For a list of diseases, contact Student and Employee Health.

COUNSELING CENTER

The Counseling Center provides services to all students and staff and faculty members. Services provided include individual counseling, couples counseling, psychiatric consultation, and medication management. All services are confidential.

The professional staff includes social workers, a psychologist, psychiatrists, and a substance abuse specialist. The Counseling Center is not a training site for students. The staff provides free services, including individual and couples counseling, psychiatric consultation, medication management, assistance with substance abuse problems, and up to 16 mental health visits.

All students registered at the University pay a student mental health fee as part of their tuition and are eligible to take advantage of the Counseling Center's services. Costs associated with seeing a therapist usually are covered by health insurance; however, no one is ever denied services based on inability to pay.

The center tries to accommodate students' class schedules. Students can call the center at 410-328-8404 for an appointment. The center is in the Baltimore Student Union at 621 W. Lombard St., Suite 218. The hours are 8:30 a.m. to 5 p.m., Monday through Friday, and two evenings until 7 p.m. Messages left on voice mail after normal office hours will be returned the next business day. For mental health emergencies after hours, call Student and Employee Health at 410-328-8792.

PARKING AND TRANSPORTATION

Campus parking is available to students. Commuter students must obtain a parking permit which costs \$1. The permit allows for parking on campus but does not guarantee a parking space. Commuters can park at the Lexington Garage (Lexington and Pine streets) and Koester's open lot (Lexington and Arch streets) for \$3.50 per day. Parking is on a first-come, first-served basis. When spaces are unavailable, students will be directed to other lots.

Students who live on campus pay for parking by the semester or year and are guaranteed 24-hour parking in a garage adjacent to their residence facility. For more information about campus parking, write Parking and Commuter Services, University of Maryland, 622 W. Fayette St., Baltimore, MD 21201, call 410-706-6603, or go online to www.parking.umaryland.edu.

The campus also sponsors a "Caravan" shuttle bus service that transports students from designated areas on campus to the main parking facilities and to several nearby neighborhoods. The service is free to students, faculty, and staff with University ID. For more information about the schedule, call 410-706-CVAN (2826), visit www.umbc.edu/transit/caravan/htm, or call the University's student services office for the schedule and routes (410-706-7117/7714 voice/TTD). The Caravan does not run when the University is closed due to inclement weather. Call 410-706-8622 for the latest, most reliable information on campus closings.

Public transportation makes the campus accessible by bus, subway and light rail. A number of Mass Transit Authority bus routes serve the campus. For more information, call the MTA at 410-539-5000. The Baltimore Metro Subway runs from Owings Mills to the Johns Hopkins medical institutions. Stops closest to campus are at Lexington Market and Charles Center. For more information, call the MTA number above. The Light Rail runs from northern Baltimore County to Glen Burnie and the BWI Airport. The stop closest to the University is at Baltimore Street. The Maryland commuter train service (MARC) runs from Camden Station, 301 W. Camden St., to Washington, D.C. For more information, call 800-325-7245. The Amtrak train stops at Penn Station, 1500 N. Charles St. at Mt. Royal Ave. For more information, call 800-523-8720.

LIVING IN BALTIMORE

Baltimore is a fun, friendly city with many affordable and convenient housing options. The Residence Life Office is structured to provide University students and affiliates with the information they need to find suitable living arrangements both on campus or off campus. The Residence Life Office is located in Room 122 of the Baltimore Student Union. For more information, call 410-706-7766 or visit www.housing.umaryland.edu.

On-campus housing includes two University complexes—the Baltimore Student Union and Pascault Row Apartments—featuring apartments and dormitory-style rooms as well as unfurnished apartments in a half-dozen privately owned loft-district buildings on campus. For more information, call the number above or visit www.housing.umaryland.edu/oncampus.htm.

The University's off-campus housing program is a self-service program designed to help students and University affiliates identify housing options convenient to the University. Although this program is coordinated by University personnel, it is offered only as a convenient way to facilitate the housing search. The University does not inspect the properties listed through this program and, therefore, strongly encourages individuals to personally do so before signing a lease. Finally, the University has no relationship with the property owners, landlords, or realtors that list property through this program. For more information about off-campus housing, call 410-706-8087 or visit www.housing.umaryland.edu/offcampus.htm.

THE CITY OF BALTIMORE

In addition to professional opportunities, Baltimore offers a stimulating environment in which to live and study. Several blocks from the campus is the nationally acclaimed Inner Harbor area, where Harborplace, the National Aquarium, the Maryland Science Center, and other facilities share an attractive waterfront with sailboats, hotels, restaurants, and townhouses. The Baltimore Metro Subway, Light Rail, and buses link downtown with the suburbs.

Baltimore boasts lively entertainment, world-class museums, fine music, and professional theaters. For sports fans, Baltimore features Orioles baseball, Ravens football, and the Baltimore Bayhawks major-league lacrosse team. Oriole Park at Camden Yards and the Ravens' stadium are a few blocks from campus. The nearby Chesapeake Bay offers unparalleled water sports and the seafood for which the region is famous. For more information about Baltimore, visit www.livebaltimore.com or www.colltown.org.

CLOSE TO WASHINGTON, D.C.

The campus is located 50 miles north of the nation's capital—home to many national professional organizations, including the American Association of Colleges of Pharmacy and the American Pharmaceutical Association. The School's proximity to the District of Columbia offers numerous opportunities for students and faculty members to participate in health care policy and research programs or activities. Many students complete their experiential rotations with these organizations. An economic, political, and cultural center, Washington also affords many researchers access to some of the world's best libraries, including the Library of Congress and the National Library of Medicine.

Washington also offers countless sightseeing opportunities. Visitors to the city of monuments, memorials, and museums frequent historic landmarks such as the Capitol, the White House, and Ford's Theater, as well as explore the Smithsonian Museums or the National Zoo. Washington is also served by an excellent public transportation system. For more information about Washington, visit www.district-of-columbia.com.

Doctor of Pharmacy (PharmD) Program

The Doctor of Pharmacy (PharmD) Program at the University of Maryland has been developed in partnership with practitioners from all areas of pharmacy and emphasizes problem solving, critical thinking, patient-focused content, and experiential opportunities across the breadth of practice. Due in part to this innovative curriculum, the School is ranked seventh among the nation's 84 pharmacy schools. In addition to the full-time day PharmD program, the School offers a Nontraditional PharmD Pathway as a mechanism for licensed, practicing pharmacists to earn the PharmD degree. The School uses a rolling admissions process. Information about the PharmD program can be viewed on the School's Web site: www.pharmacy.umaryland.edu.

GOALS OF THE DOCTOR OF PHARMACY CURRICULUM

The goals and objectives of the PharmD program are consistent with the School's strategic plan:

- The School of Pharmacy seeks to help individuals gain the knowledge and skills necessary to begin pharmacy practice, and in so doing, accept and perform professional responsibilities with competence. Graduates should have the ability to adapt their practice to the changing health care system and should be prepared to engage in a continuing program of professional development.
- The professional curricula will be innovative and flexible, based on strong basic sciences, have extensive clinical content taught by practice-based faculty members and emphasize the development of problem solving and collaborative skills. The curricula also will provide the opportunity for advanced professional and clinical education.
- The School seeks to create an educational community that extends beyond traditional classroom sites and offers students and faculty members a variety of learning environments. These will include cultural and interprofessional programs which broaden the experiences of our graduates.

GENERAL ADMISSIONS INFORMATION

Admissions and application information for the PharmD Program may be obtained by calling 410-706-7653 or 800-852-2988 or by writing to the School of Pharmacy, University of Maryland, 20 N. Pine St., Room 224, Baltimore, MD 21201-1180, ATTN: Admissions. For students interested in the Nontraditional PharmD Pathway, the address is School of Pharmacy, University of Maryland, 20 N. Pine St., Room 224, Baltimore, MD 21201-1180, ATTN: Nontraditional Pathway.

Inquiries about the admissions process may be sent by e-mail to *PharmD help@rx.umaryland.edu*. The admission, application, and programs information for the PharmD programs are as follows:

Admissions Information

An admissions committee comprised of faculty members and students reviews official transcripts and PCAT results to make admissions decisions. Applicants with strong academic credentials and PCAT scores are invited to interview with faculty members, alumni, and students. During the interview, the applicant is assessed on factors such as professional and social awareness, verbal and written communication skills, integrity, maturity, and motivation. Following the interview, the admissions committee makes a decision based on the applicants' academic achievement, PCAT scores, and qualities evaluated during the interview. Academic achievement and/or high PCAT scores do not, in themselves, ensure acceptance.

While a minimum GPA of 2.5 (A = 4.0) is required for admissions consideration, the average entering GPA of the fall 2000 first-year PharmD students was 3.5. Average PCAT scores of admitted students were above the 80th percentile in each of the five areas of the exam. Competition for admission is high, and applicants with GPAs below 2.9 have an extremely low probability of admission. All applicants must present evidence (via official transcripts) of having completed the prepharmacy coursework with grades of at least a C or better.

PREPHARMACY COURSEWORK

Applicants must complete a minimum of 63 semester hours of coursework of pharmacy prerequisites for admission into the PharmD program. At least one semester of this coursework must be taken at an accredited institution in the United States. To enroll in **prepharmacy** coursework, applicants must apply directly to an accredited college or university, **not** to the School of Pharmacy. Most institutions have designated prepharmacy programs and advisors. *The School of Pharmacy does not provide any specific information regarding course content and/or requirements for admission into these prepharmacy programs.* Prerequisites for admission into the PharmD program are as follows:

COURSE	TYPICAL # OF SEMESTERS	TYPICAL # OF CREDIT HOURS
English (Comp/Lit)	2	6
Calculus	1	4
Statistics	1	3
Biology	1	4
Microbiology	1	4
General Chemistry	2	8
Organic Chemistry	2	8
Physics	2	8
Humanities/Social Sciences	6	18
TOTAL		63 minimum

INTERNATIONAL STUDENT APPLICANTS

International student applicants must follow the procedure described above to apply for admission to the PharmD program. Additionally, students who are not citizens or permanent residents of the United States must submit the results of the TOEFL, certified official copies of transcripts, a statement of financial support, a supplementary information sheet, and a summary of educational experiences. These must be submitted with the application and the application fee to the office of records and registration. International students are also required to take the PCAT. Therefore, it is essential that international students start the admissions process early.

The School does not accept applicants who have attended only a foreign educational institution. The School, due to its small size, cannot adequately certify international credentials and relies on the evaluation performed by other institutions. In addition, experience shows that international students benefit from taking courses at other U.S. institutions before entering our program. International students should be familiar with the rules and regulations of the Immigration and Naturalization Service, which grants admission to the United States.

INTERNATIONAL PHARMACIST APPLICANTS

International pharmacists are also eligible to apply to the School's PharmD program and then upon graduation become eligible to complete state licensure exams. Credit may be given for equivalent coursework previously completed with a grade of C or better. Credit may be awarded after an evaluation of the course and an assessment of student knowledge by the coursemaster. Based on the structure of the curriculum, international pharmacists typically enter the first or

second professional year of the four-year PharmD program. Admission is based on an evaluation of applicant credentials by the admissions committee. International pharmacists are encouraged to take the PCAT exam to assess background knowledge.

APPLICATION PROCEDURE

Applicants must follow the procedure described below to apply to the PharmD. Application forms are typically available in August for the following academic year. To apply, applicants should follow the procedure below:

- Request an application from *www.pharmacy.umaryland.edu*, call 410-706-7653/800-852-2988, or write to the following address for an application and other admissions information:
School of Pharmacy
University of Maryland
20 N. Pine St.
Baltimore, MD 21201-1180
ATTN: ADMISSIONS.
- Submit a completed application and materials by the deadlines:
March 1 Application
May 1 Transcripts and PCAT scores
- Submit official transcript(s) from all higher education institutions attended. Prepharmacy coursework must be completed before the start of classes in the fall semester of application with a grade of C or better.
- Submit the required nonrefundable application fee. Make check payable to: **University of Maryland**.
- Take the Pharmacy College Admission Test in October or January and forward the scores to the School. Applicants may request a PCAT application at the phone number or address above.

PHARMD PROGRAM DESCRIPTION

The four-year Doctor of Pharmacy program is divided into six levels: Fundamentals, Basic Science, Pharmaceutical Science, Integrated Sciences and Therapeutics, Experiential Learning, and Curriculum Practice Interface. The academic focus of each level is described below:

Level I: Fundamentals

Students entering the PharmD program have diverse educational and life experiences. Level I addresses these diversities with introductory courses covering the concept and scope of pharmaceutical care, pharmacy practice in general, and the variety of disciplines that will contribute to pharmaceutical education. Students are provided the skills and scientific principles and concepts fundamental to

subsequent curricular experiences. Students develop professional attitudes and behaviors that extend throughout the curriculum.

Level II: Basic Sciences

During Level II of the curriculum, students build on the fundamentals of Level I through a comprehensive examination of basic biological, chemical, physical, social, and behavioral sciences. These elements provide the foundation for understanding pharmaceutical sciences and the complexities of drug action and use.

Level III: Pharmaceutical Sciences

Level III addresses pharmaceutical science content areas as they relate to the needs of patients in the total health care environment. The provider of pharmaceutical care must possess a detailed and comprehensive understanding of the physical, chemical, biological, and psychosocial factors affecting the outcomes of drug therapy in specific patients with specific diseases.

Level IV: Integrated Sciences and Therapeutics

Level IV addresses the extensive interweaving of basic pharmaceutical and clinical science as well as the interrelated bodies of knowledge involved in total pharmaceutical care. Students build upon their basic and pharmaceutical science background as they actively participate in a variety of didactic and laboratory experiences to design, implement, manage, and monitor individualized pharmaceutical care plans. Students learn to appreciate that the successful outcomes of drug therapies depend on complex physical, chemical, biological, and psychosocial interactions within human systems, and therefore require individualized attention to patients during the design and delivery of pharmaceutical care. This application of these principles is taught by presenting diseases of different body systems within the broader context of public health, epidemiology, prescriber education, disease prevention, and health promotion issues.

Three progressive components are used to present each disease. The first component reviews the drugs and biologicals used to treat specific disease processes and emphasizes comparative features underlying the choice of agent (Pharmacodynamics and Pharmacokinetics). Chemical properties, such as solubility and stability, that determine the choice and use of the products, are discussed (Biomedical Chemistry and Pharmaceutics). The availability and comparative advantages of drug dosage formulations and delivery systems are considered as they relate to the optimum use of drug products during acute or chronic care (Biopharmaceutics).

The second component illustrates how the links between the scientific knowledge of the disease, available drug products, and the variables underlying a particular patient's condition are important to developing the most appropriate therapeutic plan. Methods for the choice of drug products, definition of specific goals of therapy, including how to assess whether these goals are being achieved, and active intervention steps to ensure successful outcomes of drug therapy, are developed (Therapeutics). Methods for monitoring, identifying, and responding to untoward consequences of drug therapy are identified (Toxicology and Adverse

Drug Reactions). The choice and design of specific acute and chronic drug therapy, the impact of a variety of patient-related variables on dosage regimens, and the modification of dosage regimens in response to changing patient needs are developed (Clinical Pharmacokinetics). Students develop skills as they practice counseling patients about their therapeutic plans in particular and providing health education in general (Counseling and Education).

The third component links the knowledge base of the first two components with appropriate ongoing methods for drug use review, medical audits, and cost considerations. The emphasis is on identifying specific interventions to improve prescribing patterns and reduce the cost of health care (Drug Use Evaluation).

Level V: Experiential Learning

Experiential learning is a series of structured learning and training activities during which students work under the supervision of experienced clinical and academic faculty in a variety of health care settings. Students obtain and apply knowledge and skills necessary for successful delivery of pharmaceutical care and develop competence, confidence, and maturity as responsible professionals. An innovative feature of the program is that experiential learning activities occur throughout the curriculum and are linked to didactic courses. A total of 33 credits in experiential courses (approximately 1,600 hours) are required for the Doctor of Pharmacy degree. All students must complete at least 24 credits (1,100 hours) of experience devoted to pharmaceutical patient care. Successful completion of the experiential learning portion of the School's curriculum is accepted by the Maryland Board of Pharmacy as meeting the internship requirements to sit for the NABPLEX licensure examination.

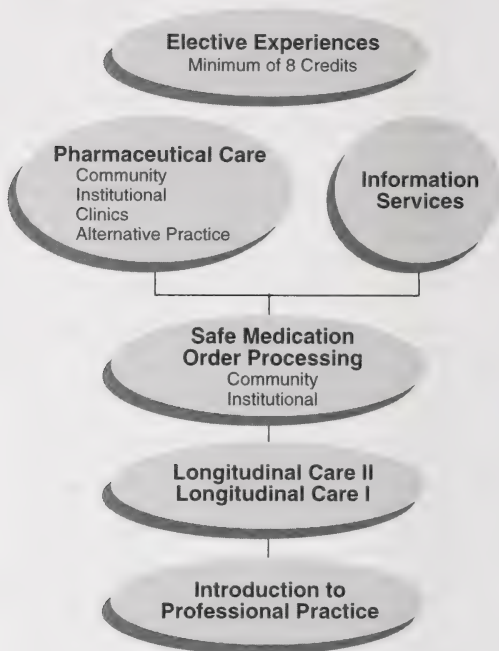
The Experiential Learning portion of the PharmD curriculum is organized into the six phases described below:

Phase 1: Introduction to Professional Pharmacy Practice. This early practice experience introduces students to the professional responsibilities of pharmacists in a variety of practice environments, including community, hospital, and specialty settings. Students will also examine the spectrum of career opportunities available to today's pharmacist and begin developing basic practice skills.

Phase 2: Longitudinal Pharmaceutical Care. During the second and third years of the curriculum, students observe and participate in the delivery of pharmaceutical care to patients. For each course, students follow the changing needs of a patient for one year within the context of the total health care system. Through direct patient encounters and discussion sessions, students learn to assess health status, communicate effectively, and determine pharmaceutical care needs from a holistic perspective. These activities are linked to material covered in the didactic curriculum.

Phase 3: Safe Medication Order Processing. Activities during this phase develop students' competency and proficiency in the technical functions of drug dispensing and distribution in institutional and community pharmacy settings. Students learn to receive, interpret, and verify the appropriateness of prescription orders and to efficiently dispense a variety of manufactured and compounded

Experiential Learning Map



medications. Emphasis is placed on communication, prevention of medication errors, the role of technology, and supervision of ancillary personnel in the medication order process.

Phase 4: Pharmaceutical Care. Students gain experience in the delivery of pharmaceutical care in a variety of practice environments, including community-based and acute-care hospital pharmacies, as well as ambulatory primary care and interdisciplinary clinics. Through daily encounters with patients and other health care providers, students learn to collect patient-specific data, identify and assess drug-related problems, develop monitoring plans, and measure therapy outcomes. Further, students learn to educate patients and health care professionals regarding the appropriate use of drugs.

Phase 5: Informational Services. Activities during this phase, which occurs simultaneously with Phase 4, require students to provide drug information in the context of delivering pharmaceutical care. Students learn to receive a question in a comprehensive fashion, thoroughly analyze and research questions, and provide appropriate answers to other health care providers and to patients and their families.

Phase 6: Elective Experiences. Elective rotations allow students to pursue their own areas of interest. Electives in general practice environments enable students to develop greater skill, proficiency, and confidence. Electives in specialty pharmacotherapeutic practice areas, alternative forms of advanced practice management, and research afford opportunities to explore a variety of practice options. This phase is linked to a senior colloquium.

Student's performance during all six phases is evaluated by both clinical and academic faculty. **Experiential rotations are not permitted at sites where students are working for pay or where any other conflict of interest situation may exist.**

Level VI: Curriculum Practice Interface

The sixth and final level of the curriculum contains a variety of educational experiences for students about to enter practice. Required and elective content areas provide the curricular-based interface with pharmacy practice that builds on the preceding didactic and experiential components of the curriculum. The *capstone* nature of this interface reflects the acquisition and appreciation of information that:

- is on the cutting edge of pharmacy practice,
- represents closing options for individual curricular pathways, or
- helps prepare students for a post-graduate education.

Students learning at the interface are expected to be under continual change and development. One goal of this level is to allow each senior student, following completion of his or her experiential components, time to consider an individual practice in the context of the total health care environment. An important part of this interface, therefore, is the opportunity for students to reflect interactively upon their educational experiences with fellow students, faculty members, and practitioners.

In the curriculum, students are trained to perform well at the patient level as well as the health system level. For example, on the patient level, students become active participants in the development of patient therapeutic plans. They select appropriate dosage forms, routes of administration, and dosage schedules. They prepare medications for patient use, counsel patients, maximize patient adherence to drug therapy, and assess therapeutic objectives. On the system level, students participate in medication-use process with other health care providers, assist patients in public health education programs, monitor pharmaco-economic and pharmacoepidemiology issues in health care delivery, and participate in the formation of health policy.

CURRICULUM PATHWAYS AND ELECTIVES

The central curricular theme, primary pharmaceutical care, encompasses the educational experiences common to all students in the program. All students must successfully complete the required core curriculum, which prepares them for competent performance of basic pharmaceutical care in a variety of professional and practice settings. To supplement the required core curriculum, students take more than 21 percent (28 credits) of the four-year curriculum from the didactic and experiential electives. This portion of the curriculum provides students with an opportunity for flexible programming of their educational experiences. In collaboration with their academic advisors, students use electives to develop a *Plan of Study* that is consistent with their personal interests and career goals. Student's *Plan of Study* is used to enhance their general practice of pharmaceutical care, to focus on a particular area of practice, or to prepare for post-graduate studies.

Students may select freely from elective options to design their *Plan of Study* or may choose one of five model *pathways* designed to enhance their preparation for common areas of interest. The model pathways generally account for 16 to 18 of the 28 elective credits required for the degree. Therefore, students' selection of a model pathway still provides them considerable flexibility in selection of additional electives.

Faculty pathway coordinators, who design and maintain the integrity of the pathways, and faculty advisors with expertise in each pathway area serve as consultants to students for information on career opportunities resulting from a particular pathway. Students have freedom of choice in selecting a pathway. Students, not choosing to take all courses in a specific pathway, can select elective courses from multiple pathways as part of their personal *Plan of Study*, provided they complete the appropriate prerequisites. Faculty have developed the following five model pathways:

ADVANCED PHARMACY PRACTICE

The goal of this pathway is to prepare students to implement pharmaceutical care in a variety of practice settings. This pathway provides a series of didactic and experiential courses designed to enhance competence in delivering pharmaceutical care in general practice and in delivering health care to special populations such as the elderly; to enhance knowledge of special pharmaceutical products, business and managerial skills needed to successfully deliver new services; and to provide experience in applying these professional and managerial skills in a variety of advanced practice settings.

GERIATRIC PHARMACY PRACTICE

This pathway is designed to prepare graduates to work with older individuals in a variety of practice settings or pursue advanced degrees (PhD, MPH) or training

(fellowships, residencies) in the area of geriatrics or gerontology. By completing this pathway, graduates will learn essential principles to manage medication-related issues as well as understand the complexities in caring for the elderly. Outcomes are to develop a database of current students and graduates focusing in the area of geriatrics. Students selecting this pathway must complete 12 credits: the core 5 credits of didactic electives, 4 credits of other geriatric-focused electives or special projects, and 3 credits of geriatric-focused geriatric rotations.

MANAGEMENT

This pathway is designed to prepare students for management careers in corporate pharmacy, to develop entrepreneurial capabilities, and to prepare students for post-PharmD management residencies and/or MBA programs. Students take a series of didactic and experiential courses in personal management, practice management, organizational behavior, financial reporting and analysis, marketing, and working with managers in health care settings.

PHARMACOTHERAPY

The goal of this pathway is to enhance students' ability to independently optimize, implement, and monitor drug therapy in patients with complex health problems. This pathway offers a series of didactic seminar courses in pharmacotherapy and advanced therapeutics, coupled with advanced clinical experiences. The clinical experiences involve direct drug therapy management of patients in general medical and sub-specialty environments. Students completing this pathway are encouraged to pursue post-PharmD training in residencies and fellowships and to eventually pursue specialty board certification in pharmacotherapy.

RESEARCH

The goal of this pathway is to expose students to research and better prepare them for graduate studies or postgraduate fellowships. Students selecting this pathway take courses in advanced educational opportunities and advanced seminar courses in selected scientific areas. They receive research experiences, working directly with faculty scientists, and take a senior colloquium. Students are also encouraged to pursue the PharmD/PhD dual degree program (see the "PharmD Dual Degree Programs" section).

PHARMD PROGRAM SUMMARY

The faculty continue to revise the curriculum based on the dynamics of pharmacy education, the needs of practice, and the students. The exact nature of the

curriculum may vary from class to class. The following describes the PharmD curriculum by semester.

COURSEWORK	MINIMUM SEMESTER CREDITS
Didactic	99 credits
79 Required	
20 Elective	
Experiential	33 credits
25 Required	
8 Elective	
TOTAL	132 credits

Coursework by Semester

The outline below suggests when electives can be taken. Electives can be taken during most fall, winter, spring, and summer semesters. The following outlines the curriculum for the current and future classes by semester.

Proposed Transition Curriculum for Fall 2001–Spring 2003

For the Class of 2005		For the Class of 2006	
FALL 2001	CREDITS	FALL 2002	CREDITS
FIRST-YEAR COURSES		FIRST-YEAR COURSES	
PHAR 510—Biochemistry	3	PHAR 510—Biochemistry	3
PHAR 513—Drug Chemistry	2	PHAR 513—Drug Chemistry	2
PHAR 514—Human Biology I	3	PHAR 514—Human Biology I	3
PHAR 516—Pharmacy Prac & Educ	2	PHAR 516—Pharmacy Prac & Educ	2
PHAR 522—Context of Health Care	3	PHAR 522—Context of Health Care	3
PHAR 523—Ethics in Pharmacy Practice	1	PHAR 523—Ethics in Pharmacy Practice	1
PHPC 510—Intro to Professional Practice I	1	PHAR 526—Physical Chemistry	2
		PHPC 510—Intro to Professional Practice I	1
TOTAL	15		17
SPRING 2002	CREDITS	SPRING 2003	CREDITS
FIRST-YEAR COURSES		FIRST-YEAR COURSES	
PHAR 517—Study Design	2	PHAR 520—Molecular Biology	3
PHAR 520—Molecular Biology	3	PHAR 524—Human Biology II	3
PHAR 524—Human Biology II	3	PHAR 531—Pharmaceutical Chemistry	2
PHAR 525—Immunology	2	PHAR 537—Principles of Drug Action	2
PHAR 526—Physical Chemistry	2	PHAR 541—Biopharmaceutics/Kinetics	3
PHAR 537—Principles of Drug Act	2	PHPC 520—Intro to Professional Practice II	1
PHPC 520—Intro to Professional Practice II	1	Didactic Electives	2
Didactic Electives	2		
TOTAL	17		16

FALL 2002	CREDITS	FALL 2003	CREDITS
SECOND-YEAR COURSES		SECOND-YEAR COURSES	
PHAR 530—Microbiology/Antibiotics I	3	PHAR 517—Study Design	2
PHAR 531—Pharmaceutical Chem	2	PHAR 525—Immunology	2
PHAR 532—Patient Assessment	1	PHAR 530—Microbiology/Antibiotics I	2
PHAR 534—Human Biology III	3	PHAR 532—Patient Assessment	1
PHAR 536—Pharmacology I	3	PHAR 533—Medicinal Chemistry I	1
PHAR 541—Biopharmaceutics/Kinetics	3	PHAR 534—Human Biology III	3
Didactic Electives	2	PHAR 536—Pharmacology I	3
		Didactic Electives	2
TOTAL	17		16

SPRING 2003	CREDITS	SPRING 2004	CREDITS
SECOND-YEAR COURSES		SECOND-YEAR COURSES	
PHAR 535—Pharmaceutics	3	PHAR 535—Pharmaceutics	3
PHAR 540—Microbiology/Antibiotics II	1	PHAR 540—Microbiology/Antibiotics II	2
PHAR 542—Clinical Chemistry	1	PHAR 542—Clinical Chemistry	1
PHAR 544—Medicinal Chemistry	3	PHAR 543—Medicinal Chemistry II	2
PHAR 545—Practice Management	3	PHAR 545—Practice Management	3
PHAR 546—Pharmacology II	3	PHAR 546—Pharmacology II	3
PHPC 532—Longitudinal Care	1	PHPC 532—Longitudinal Care	1
Didactic Electives	2	Didactic Electives	2
TOTAL	17		17

For the Classes of 2002, 2003, 2004

SEMESTER ONE	CREDITS
PHAR 511—Biochemistry	3
PHAR 512—Cell Biology	2
PHAR 513—Drug Chemistry	2
PHAR 514—Human Biology I	3
PHAR 515—Personal Management	1
PHAR 516—Pharmacy Practice and Education	3
PHAR 517—Study Design and Analysis	2
TOTAL	16

SEMESTER TWO	CREDITS
PHAR 521—Biology Chemistry II	3
PHAR 522—Context of Health Care	3
PHAR 523—Ethics in Pharmacy Practice	1
PHAR 524—Human Biology II	3
PHAR 525—Immunology	2
PHAR 526—Physical Chemistry	2
PHPC 527—Introduction to Professional Practice	1
Didactic Electives	2
TOTAL	17

SEMESTER THREE	CREDITS
PHAR 530—Microbiology/Antibiotics I	3
PHAR 531—Pharmaceutical Chemistry	2
PHAR 534—Human Biology III	3
PHAR 536—Pharmacology I	3
PHAR 537—Principles of Drug Action	2
PHAR 541—Biopharmaceutics and Pharmacokinetics	3
Didactic Electives	2
TOTAL	18

SEMESTER FOUR	CREDITS
PHAR 535—Pharmaceutics	3
PHAR 540—Microbiology/Antibiotics II	1
PHAR 542—Clinical Chemistry	1
PHAR 544—Medicinal Chemistry	3
PHAR 545—Practice Management	3
PHAR 546—Pharmacology II	3
PHPC 532—Longitudinal Pharmaceutical Care I	1
Didactic Electives	2
TOTAL	17

For all Years

SEMESTER FIVE	CREDITS
PHAR 552—Principles of Human Nutrition	1
PHAR 553—Population Based Medical Information Analysis	2
PHAR 554—Integrated Science/Therapeutics I	4
PHAR 555—Integrated Science/Therapeutics II	4
Didactic Electives	4
TOTAL	15

SEMESTER SIX	CREDITS
PHAR 564—Integrated Science/Therapeutics III	4
PHAR 565—Integrated Science/Therapeutics IV	4
PHPC 562—Longitudinal Pharmaceutical Care II	1
Didactic Electives	6
TOTAL	15

SEMESTER SEVEN	CREDITS
PHPC 570—Safe Medication Order Processing in Community Pharmacy	3
PHPC 571—Safe Medication Order Processing in Institutional Pharmacy	3
PHPC 572—Pharmaceutical Care I	3
PHPC 573—Pharmaceutical Care II	3
TOTAL	12

SEMESTER EIGHT	CREDITS
PHAR 580—Pharmacy Law	2
PHAR 581—Senior Colloquium	1
PHPC 574—Pharmaceutical Care III	3
PHPC 575—Pharmaceutical Care IV	3
PHPC 576—Ambulatory Clinic ¹	1
PHPC 577—Informational Services ¹	2
Experiential Electives ²	8
Didactic Electives	4
TOTAL	24

GRAND TOTAL **132 MINIMUM CREDITS**

¹Students take concurrently with Pharmaceutical Care Rotations.

²Students complete experiential rotations at various times during the year but register for the rotations in the semesters listed.

NONTRADITIONAL PHARM D PATHWAY

The Nontraditional PharmD (NTPD) Pathway is for licensed pharmacists who have a Bachelor of Science in Pharmacy degree and seek to earn the Doctor of Pharmacy degree. The admission, application, and program information follows.

ADMISSIONS INFORMATION

To be considered for admission to the Nontraditional PharmD Pathway, BS pharmacists, including pharmacists who graduated from international institutions, must complete the application and admission requirements listed below. Once pharmacists have demonstrated that they meet those criteria, they will be considered for admission. A description of required documentation and other elements of the admissions process will be provided in the application packet. Because of the highly interactive nature of the pathway, the School cannot accommodate more than 60 new students each year.

An admissions committee comprised of faculty and students reviews official transcripts and PCAT results to make admissions decisions.

APPLICATION PROCEDURE

Applicants must follow the procedure described below to apply to the Nontraditional PharmD Pathway. Application forms are typically available in August for the following academic year. To apply, applicants should follow the procedure below:

- Request an application from www.pharmacy.umaryland.edu, call 410-706-0761 or write:
School of Pharmacy
University of Maryland
20 N. Pine St.
Baltimore, MD 21201-1180
ATTN: Nontraditional PharmD Pathway.
- Request and submit a completed application by the deadline:
July 1 Application
August 1 All supporting documents
- Submit the required nonrefundable application fee. Make check payable to: **University of Maryland.**
- Must be licensed in Maryland, the District of Columbia, or an adjacent state.

- Must practice in Maryland, the District of Columbia, or areas of surrounding states to have access to the pathway's mentoring system.
- Must provide confirmation of access to patients to meet pathway requirements.

PROGRAM DESCRIPTION

The Nontraditional PharmD (NTPD) Pathway is for licensed pharmacists who have a Bachelor of Science in Pharmacy degree and seek to earn the Doctor of Pharmacy degree. All graduates will be required to meet the terminal performance outcomes of the School's PharmD program, with at least 30 credits of coursework. Since each nontraditional student brings to the program a different level of practical experience, knowledge and skills developed throughout a practice career, a system of Prior Learning Assessment (PLA) has been developed to individualize a program of study and award up to 10 credits when appropriate. It should be noted that the awarding of credit through assessment of prior learning does not exempt a participant from responsibility for any of the process- or knowledge-based outcomes of the program.

The foundation of the NTPD Pathway is the development of the knowledge, skills, and abilities for the delivery of pharmaceutical care. Credits in the NTPD Pathway may be earned by taking courses from a faculty-approved plan of study, through supervised experiential learning, by approved self-study or electives with appropriate assessment, and through PLA. Examples of required pathway courses include Principles of Pharmaceutical Care, Principles of Literature Evaluation, Medical Information Analysis, Patient Assessment, and in-depth Pharmacotherapeutics for prevalent diseases. In Practice Management, candidates will demonstrate the ability to assess resources, to fiscally and behaviorally manage a practice, to measure the value of service(s), to establish fees and reimbursement policies, and to market and promote pharmaceutical care services.

Courses are offered at the University of Maryland in downtown Baltimore, and selected course content may be offered through distance education facilities in Maryland. Required classes are planned for the fall and spring semesters; however, first-year students will always begin in the fall semester. Unless they have been approved for a leave of absence, students will be expected to enroll in at least one course each semester. Most students complete the program in three to four years; however, all 30 credits must be earned within seven years of initiation of coursework.

Experiential Learning

Experiential learning will be centered in the pharmacist's own practice site, under the supervision of a faculty mentor; one credit of clerkship experience is required at other sites. The faculty mentor will work closely with each pharmacist to identify an appropriate mix of his or her own patients and to develop an experience component that will meet individual needs, satisfy pathway requirements, and

benefit patients. Beginning with the initial patient identified as a study case, students will learn to triage, develop explicit pharmaceutical care plans, and initiate the patient management process. To monitor progress and provide feedback to students, faculty mentors will use performance-based evaluation.

While the central philosophy of the NTPD experiential learning component is to provide for an impact on patients in the pharmacist's own practice, it is anticipated that it will not always be possible to completely meet experiential learning objectives at that site. When it is necessary for exposure to the delivery of pharmaceutical care services at other practice sites, every effort will be made to schedule these visitations at convenient times.

PROGRAM REQUIREMENTS

In addition to coursework, the credit requirements of the NTPD may be partially met through the following three options:

Transfer Credits

NTPD students may transfer up to six credit hours of previous coursework to meet the NTPD pathway requirements. This coursework must have been completed after the pharmacist received his or her BS degree and must have been earned at an accredited university. The coursework must also relate directly to curricular components of the NTPD pathway. Identification of potential transfer courses is done at the time of admission, or later if appropriate, through consultation between the student and the NTPD pathway director. (Note: It is not possible to obtain additional PLA credit for transfer courses.)

Prior Learning Assessment (PLA)

The Prior Learning Assessment process provides a mechanism through which students may earn credit for the knowledge and experience they bring to the program. To be eligible for PLA credit, students must complete the PLA course and provide their portfolio for PLA panel evaluation and faculty approval of the credit recommendation from the panel. The PLA panel is comprised of School faculty members and pharmacy practitioners. Students may earn a maximum of 10 credits through this process. Credits are partitioned into four areas: Practice Management Planning (0-1), Community/Institutional Pharmaceutical Care (0-1), Pharmacotherapeutics (0-4), and Practice Management (0-4). These four areas correspond directly to curricular components.

Credit by Examination

The University permits a credit-by-examination process for a course. Information about the test-out option is provided by each coursemaster. Students who successfully complete the entire course by examination may register for Credit by Examination in the specific area. Students pay a per-course fee, which varies according to residency status. Upon approval of the coursemaster, students who successfully complete a discrete section of the examination may not be required

to attend all class sessions and/or modules. In this case, students must still register for the course and the results of the examination will be factored into the grade determination. For more information, students may call 410-706-0761.

PHARMD DUAL DEGREE PROGRAMS

The School offers three dual degree programs for PharmD students who are interested in gaining specialized expertise in law, business administration, or research. Students apply to these programs in the second year of the PharmD program. The dual degree programs have separate admission requirements. The programs are briefly described below:

PHARMD/JD PROGRAM

The School offers a dual Doctor of Pharmacy/Juris Doctor degree program with the University of Maryland School of Law for students who wish to pursue the Juris Doctor. The PharmD/JD program allows students to gain the requisite knowledge in legal skills in a variety of areas. Graduates of this program will be prepared for careers in a diverse range of health care and legal areas. PharmD students can use 16 credit hours obtained from the law curriculum to fulfill their 20 hours of didactic pharmacy electives. Students could complete the dual degree program in six years.

PharmD students must apply to the JD program and meet all admissions criteria, including submitting results of the LSAT, and adhere to the School of Law's procedures and deadlines. Admission is not guaranteed. For more information about the JD program, contact the School of Law at 410-706-3492 or e-mail admissions@law.umaryland.edu.

PHARMD/MBA PROGRAM

The School offers a dual Doctor of Pharmacy/Master of Business Administration program with the University of Baltimore Merrick School of Business for students who wish to pursue the Master of Business Administration degree. The PharmD/MBA program allows pharmacy students to take MBA courses as part of their PharmD curriculum. While in pharmacy school, PharmD students may complete 21 of the 51 credit hours required in the MBA program.

PharmD students must apply to the MBA program; admission is not guaranteed. Students wishing to apply to the MBA program must adhere to University of Baltimore (UB) procedures and deadlines. Students must also request that the University of Maryland's Office of Records and Registration send their official University of Maryland transcript and that the School of Pharmacy Office of Student Affairs send a copy of their prepharmacy transcripts to UB. Students applying to this dual program need the equivalent of a bachelor's degree (i.e.,

either a degree or completion of four years of college). The grade point average for an entering MBA student is 3.0; however, a lower GPA may be offset by a higher score on a standardized test (e.g., GMAT, PCAT). For more information about MBA program admissions, contact the program director at the University of Baltimore at 410-837-4944.

PHARMD/PHD PROGRAM

The School offers dual Doctor of Pharmacy/Doctor of Philosophy programs in Pharmaceutical Sciences and Pharmaceutical Health Services Research to prepare comprehensively trained individuals with an interdisciplinary perspective on teaching and scientific research. The PharmD/PhD program is a cooperative effort between the PharmD curriculum and the graduate curricula of the Department of Pharmaceutical Sciences and the Department of Pharmacy Practice and Science. The PharmD and PhD phases of the program run concurrently with minimal disruption of the academic content or sequencing of the PharmD component. This permits dual degree students to progress normally in the PharmD program and graduate with their class. To achieve this goal, students may take open vacation periods as well as Research Pathway electives and other elective options within the PharmD program and apply them toward meeting the requirements of the PhD degree. Students already in the PharmD program may be considered for admission to the dual degree program. Dual degree students can expect to complete their core graduate coursework and be ready for advancement to candidacy for the PhD degree by the time they complete the PharmD program. Students may complete the requirements for the award of both the PharmD and PhD degrees in six or seven years.

Consideration for admission to the PhD degree program is contingent upon satisfying the admission requirements of the University of Maryland Graduate School. A bachelor's degree is generally required for admission to the graduate program. Applicants to the PhD programs will be evaluated on the following criteria: the quality of the academic record, standardized test scores (GRE scores of 1600 or better, PCAT scores, and where applicable, TOEFL scores of at least 600), letters of recommendation, interviews, compatibility between the students' career goals and the objectives of the PhD program, and a GPA of 3.0 or better.

For more information about admissions to the PhD programs, contact the following departments: Pharmaceutical Health Services Research in the Department of Pharmacy Practice and Science, call 410-706-7613 or e-mail dmullins@rx.umaryland.edu. The Department of Pharmaceutical Sciences, call 410-706-0549 or e-mail pscprog@rx.umaryland.edu.

LICENSURE REQUIREMENTS

Students who complete the PharmD degree satisfy the educational requirement for all state boards of pharmacy in the United States. Graduates are eligible to take state licensing exams in all states. For more information about licensure as a pharmacist in Maryland, graduates may contact the Maryland Board of Pharmacy at 4201 Patterson Ave., Baltimore, MD 21215-2299 or 410-764-4755.

International pharmacists who have received their pharmacy degrees from non-U.S. institutions have two options to become licensed pharmacists in the United States. They can apply to the PharmD Program (see the International Pharmacist Applicants section of this catalog) or complete the Foreign Pharmacists Equivalency Examination, which certifies the applicant for the board examination. Individuals taking this approach would not need to attend the School of Pharmacy. For more information, write or call the National Association of Boards of Pharmacy Foundation, Foreign Pharmacy Graduate Examination Committee, 700 Busse Highway, Park Ridge, IL 60068, 847-698-6227.



Dr. Stuart Haines interviews a patient in an ambulatory care clinic.

Doctor of Philosophy Programs

Applicants seeking advanced degrees, MS and PhD, in pharmaceutical sciences or pharmacy administration must apply to the University's Graduate School departments. Interested applicants should also review the Graduate School catalog for more specific information about the MS and PhD programs. The PhD programs in pharmacy practice and science and pharmaceutical sciences are described as follows. Interested applicants may apply online at <http://graduate.umaryland.edu/admissions.html> or, if necessary, obtain an application form from the department to which they are applying.

Opportunities are available for postgraduate study: residencies, postdoctoral fellowships, and other professional studies. Contact the department for specific information.

PHARMACEUTICAL HEALTH SERVICES RESEARCH PHD PROGRAM DESCRIPTION

The graduate program in Pharmaceutical Health Services Research seeks to train scholars and researchers in one of four major research areas: economics, epidemiology, behavioral/social sciences, or policy as it relates to the delivery, use, costs, and safety of pharmaceuticals and other health care products. Each student is required to select one research area or track of specialization in which they will take advanced courses and conduct their dissertation research.

Graduates of the program will receive training to: 1) design and carry out pharmaceutical health services research based on strong training in research methodology, statistics, one or more pharmacy specialty areas, and a sound understanding of the U.S. health care system; 2) serve as a knowledgeable spokesperson to the public and private sectors of health care concerning pharmaceutical health services research, practice research, and pharmacy-related policy issues; 3) interact with members of other health, social, and administrative disciplines and initiate and/or collaborate in research endeavors related to pharmaceutical and other health services; and 4) be an effective teacher both in academic and nonacademic settings.

PHARMACEUTICAL HEALTH SERVICES RESEARCH PROGRAM OVERVIEW

The PhD graduate program in Pharmaceutical Health Services Research offers advanced training by faculty who are regional, national, and international leaders in the fields of pharmacoeconomics, pharmacoepidemiology, pharmaceutical policy, and the social and behavioral sciences. The specialized curriculum, with an emphasis on developing research skills, trains students for leadership roles in academia, government, industry, and consulting.

ADMISSIONS INFORMATION

Applicants to the Doctor of Philosophy in Pharmaceutical Health Services Research should possess a bachelor's or master's degree from an accredited college or university. Applicants without a Bachelor of Science in pharmacy or a Doctor of Pharmacy degree will be considered, but, in general, preference will be given to candidates with previous pharmacy-related education and/or experience.

Applicants must satisfy the general requirements of the University's Graduate School before consideration for admission to the program. The minimum standard for admission to the Graduate School is a B average, or 3.0 on a 4.0 scale, in a program of study resulting in the award of a baccalaureate degree from an accredited college or university.

APPLICATION PROCEDURE

Applications to the graduate program in Pharmaceutical Health Services Research should be directed to the following address: Graduate School, University of Maryland, 621 W. Lombard St., Room 336, Baltimore, MD 21201; 410-706-7131. An online application is available at http://graduate.umaryland.edu/adm_appinfo.htm. The following forms and/or documents are required for processing of an application by the Graduate School:

- Application for admission (three copies)
- Official transcripts (two copies)
- Letters of recommendation (three letters)
- Results of the Graduate Record Exam
- Processing fees for international students
- TOEFL scores
- Statement of financial status
- Immigration documents (form I-20)

Officially, applications must be received by the Graduate School by July 1 for the fall semester, December 1 for the spring semester, and by May 15 for admission to the summer semester. However, it is preferred that applications be received as early as possible. Applicants interested in receiving a teaching assistantship or research assistantship must apply by March 1. An international student application must be received six months prior to the semester of expected entrance. Contact the department for more information: Pharmacy Administration Graduate Program, School of Pharmacy, University of Maryland, 100 N. Greene St., 6th Floor, Baltimore, MD 21201-1180.

1. In addition to official transcripts and three letters of recommendation as evidence of academic potential, the student is to submit scores from the Graduate Record Examination. Graduate Record Examination scores are used as part of the date on which admission decisions are based but are seldom the sole criteria for admission.

2. Applicants are encouraged to arrange an interview with the Department of Pharmacy Practice and Science for more information. A limited number of students who fail to meet these minimum standards may be admitted to graduate study as provisional students on the basis of outstanding performance on the Graduate Record Examination and on the basis of letters of recommendation from competent judges of their performance as students or of their professional capacity. Provisional admissions carry explicit conditions (e.g., minimal grade requirements in stipulated courses) that must be met before the student can be advanced to full graduate status. Specific conditions for admission as a provisional graduate student may be found in the current edition of the Graduate School catalog.

PHARMACY PRACTICE AND SCIENCE DEPARTMENT OVERVIEW

The Department of Pharmacy Practice and Science exists for the purpose of promoting the health and well being of the public by advancing the practice of pharmacy and generating and disseminating new knowledge related to pharmacy practice and drug use. The department approaches these goals by: 1) preparing professional students, graduate students, residents, fellows, and pharmacists for the future through a variety of academic, training, and mentoring programs; 2) providing an environment conducive to the development of faculty and staff; 3) furnishing expertise, support, and leadership to professional, governmental, community, and health related organizations and agencies; 4) fostering research into the clinical and social sciences related to pharmacy practice and drug use; 5) encouraging the development of new and innovative pharmacy practice and role models; and 6) providing a structure that supports these efforts.

The department values excellence in teaching, practice, research, and service, and the contributions of its faculty and staff to the department, School, University, state, profession, and health care community.

ACADEMIC PROGRAM REQUIREMENTS

The minimum requirements for a student to receive a doctoral degree in the Pharmaceutical Health Services Research Graduate Program are detailed below. Individual students might be required to take additional courses as deemed appropriate by their curriculum committee. In particular, students without strong computer programming skills may need elective courses.

Required courses include a group of core graduate courses in pharmacoepidemiology, pharmacoeconomics, pharmaceutical policy, and the social and behavioral sciences, in addition to research methods, and statistics. Students must complete at least 12 credits of advanced courses in their research track beyond any core courses. It generally takes two to two-and-a-half years to complete the course requirements.

While many students come to the program with prior graduate work, the department requires that they take the core courses here. When non-core courses or the beginning/intermediate statistics requirements are waived, students are expected to take other advanced courses to complete the course requirements. To allow flexibility and to ensure that students are well prepared in their area of specialization, each student is asked to establish a curriculum committee by the end of their first semester of study.

The following outlines the required core course curriculum for this program:

Core Course Curriculum (33 Credits)

COURSES	CREDITS
PHSR 610—Health Care System	3
PHSR 620—Social Behavioral	3
PHSR 650—Pharmaceutical Econ	3
PHSR 670—Health Education	3
PHSR 704—Pharmacopeia	3
PHSR 701—Research Methods I	3
PHSR 702—Research Methods II	3
PREV 600—Intro to Epidemiology	3
Statistics	9
PHSR 709—Seminar*	3
Advanced Cognate	
Coursework	12
PHSR 899—Dissertation	12

*Graduate seminar is conducted weekly to inform students and faculty about new research and current issues. Seminar attendance is mandatory for all graduate students while in residency. Additionally, students must register for seminar credit in three separate seminars. Students receive one credit for successfully preparing and delivering a seminar on an ongoing research project or research proposal under the direction of a faculty member. Each student must have at least one seminar credit prior to taking his or her general comprehensive examination. Furthermore, students must present their dissertation research at least once in a graduate seminar.

Comprehensive Examination

The purpose of the comprehensive examination is to test students' depth and breadth of knowledge in the field of pharmaceutical health services research: theory, methods, statistics, and their chosen area of specialization. Students are expected to be fluent in research techniques, current developments, general research methods, study designs, statistical methods, and their professional and ethical responsibilities. Students should not only know the basic concepts, but also be able to interpret and apply them under various scenarios.

Dissertation

The dissertation is the product of intensive research at the doctoral level, distinguished by its deeper, more comprehensive, professional and scholarly treatment of the subject. The doctoral dissertation is expected to represent independent and original research in the field of the candidate's graduate study. It must add to understanding in the candidate's field. The project must be of sufficient difficulty and depth to test the candidate's ability to carry out research independently, and it should show a mastery of the skills needed for such research.

Oral Defense of Dissertation Proposal

Students must submit the proposal to the dissertation committee for review and comment. The student, in consultation with the research advisor, will schedule the oral examination to defend the research proposal.

Final Oral Exam Defense

After completing the dissertation, the candidate must defend it before the academic community. The defense is open to all members of the University graduate faculty. Regulations governing the style, format, and how to submit the dissertation for publication may be obtained from the Graduate School.

Additional Activities

- Teaching experience is required during the first year. Doctoral students in pharmaceutical health services research are expected to participate as fully as possible in opportunities to develop their teaching skills.
- Experiential learning is required of all students. In general, a student does not receive additional credit for experiential learning, but it is a significant part of the program.
- Participating in professional meetings and organizations is recommended. Students are encouraged to submit papers to local, regional, and national professional meetings.

FINANCIAL SUPPORT

Financial support is available to students accepted into the program: graduate research assistantships funded by the Graduate School, graduate research assistantships funded by faculty-sponsored projects, and graduate teaching assistantships.

PHARMACEUTICAL SCIENCES PHD PROGRAM OVERVIEW

Graduate students, staff, and faculty are pursuing a wide range of pharmaceutical research, such as the underlying biology of disease, mechanisms of drug action, drug design, and drug product design and evaluation. Pharmaceutical sciences is the largest graduate program on campus and perhaps the largest of its type in the United States. This critical mass of graduate students working with over 30 faculty and staff members, provides a stimulating environment for the pharmaceutical sciences graduate student.

Components of our multidisciplinary program include the following seven informal Research Focus Groups: Drug Design, Macromolecular Structure and Function, Cell-Based Gene/Drug Discovery, Pharmacology and Toxicology, Neuroscience, Drug Delivery/Metabolism/Pharmacokinetics, and Industrial Pharmaceutics Research. These focus groups serve as foci for research collaborations, as well as ongoing seminar series and graduate student dissertation research committees.

PHARMACEUTICAL SCIENCES DEPARTMENT OVERVIEW

The Department of Pharmaceutical Sciences is involved in understanding the underlying biology of disease, mechanisms of drug action, drug design, and drug product design and evaluation. The Department of Pharmaceutical Sciences is, by its nature, a multidisciplinary environment. Disciplines of pharmaceutical sciences can be described in the context of the areas of science that carried an idea for a cure, all the way to a vial of tablets in the medicine cabinet.

Pharmaceutical sciences contribute to the discovery, design, and development of drugs. Drug discovery and development is a dynamic process, requiring integrated efforts across classical scientific disciplines. Hence, the graduate program in pharmaceutical sciences uniquely prepares graduates for mankind's greatest intellectual and practical challenge: to discover medicines.

ADMISSIONS INFORMATION

Admission to the PhD in Pharmaceutical Sciences graduate program is contingent upon satisfying the admission requirements of the Graduate School. In most instances, candidates for admission who have earned a BA or BS degree in chemistry, biology, biochemistry, engineering, or pharmacy possess adequate preparation for the graduate program. Selected applicants may be invited for a personal interview and tour of the facilities.

Prospective students must take the Graduate Record Examination (GRE) General Test and submit the scores as part of the admissions process. Also, since entry into the program requires a proficiency in the English language, foreign students must obtain a minimum score of 600 in the TOEFL Examination and/or have taken conversational and written English coursework.

Applications for admission to the graduate program will be evaluated on the basis of their timely completion and quality of academic transcripts, GRE scores, TOEFL scores where appropriate, letters of recommendation, and the student's research objectives.

APPLICATION PROCEDURE

Applicants for the PhD in Pharmaceutical Sciences must send certain materials to the University of Maryland Graduate School, while other materials must be sent to the Department of Pharmaceutical Sciences. Applicants may review admissions procedures and requirements of the University of Maryland's Graduate School on the Web site or e-mail gradinfo@umaryland.edu or call 410-706-7131 for more information. Applicants must submit the list of materials which follows to the University's Graduate School at: Graduate Admissions and Enrollment Services, Baltimore Student Union, Room 336, The Graduate School, University of Maryland, Baltimore, MD 21201-1550.

- Submit two sets of official Graduate Record Examination (GRE) General Test scores (not copies) and two sets of official Test of English as a Foreign Language score (if international applicant) with a minimum score of 600 and/or have taken conversational and written English coursework.
- Submit two sets of official transcripts or mark sheets.
- Submit the required nonrefundable application fee. Make check payable to: University of Maryland or use a credit card.

Applicants must **also** submit the following to the School of Pharmacy Department of Pharmaceutical Sciences at: Pharmaceutical Sciences Graduate Program, School of Pharmacy, University of Maryland, 20 N. Pine St., 4th Floor, Baltimore, MD 21201-1180.

- Submit a *Statement of Academic Goals and Research Interests*. Discuss concisely your academic objectives pertaining to the pharmaceutical sciences, include contemplated research projects, professional career goals, and a description of relevant work experience, as appropriate. Type or print neatly. To facilitate your application's review, denote a primary and a secondary Research Focus Group (https://www.pharmacy.umaryland.edu/graduate/psc/PSC_Home/Research/RFGs.html) at the top of your statement.
- Submit three (3) letters of recommendation. A form is available from https://www.pharmacy.umaryland.edu/graduate/psc/PSC_Home/Admissions/admission.htm.

Master's Degree Students

- Applicants with a master's degree that did not require a thesis are required to submit recent evidence of scholarly work, such as term papers or research reports.
- Applicants are expected to be computer literate.

International Students

International students should not plan on leaving their country before obtaining official notification of admission to the graduate program from the director of graduate admissions and an I-20 form from the Office Records and Registration. The following rules apply:

- Sufficient funds must be available to support the student for one year. Students may obtain the immigration form (I-20) necessary for obtaining the appropriate visa from the University's Office of Records and Registration.
- Students already studying in the United States who wish to transfer to the University of Maryland must also secure proper immigration documents in order to request that the Immigration and Naturalization Service grant permission to transfer to the University of Maryland.
- Every international student must report to the Office of Records and Registration as soon as possible after arriving at the University.
- Students from non-English-speaking countries are considered for admission only if they have received a total Test of English as a Foreign Language (TOEFL) score of 600 (213 on the computer-based score). Because TOEFL is given only four times a year throughout various parts of the world, it is necessary for the applicant to make arrangements with the Educational Testing Service, Box 899, Princeton, NJ 08540, to take the test as soon as study at the University of Maryland is contemplated.
- Graduate students whose work indicates English language deficiencies will be required to take remedial English courses.

PHARMACEUTICAL SCIENCES PHD PROGRAM DESCRIPTION

The goal of the Department of Pharmaceutical Sciences graduate program is to prepare independent, creative scientists to function well in academe, the pharmaceutical industry, and in government or other agencies. While a master's degree program is in place, the primary degree program in pharmaceutical sciences is the PhD degree. The pharmaceutical sciences graduate program is administered through the Graduate School (www.graduate.umaryland.edu).

ACADEMIC PROGRAM REQUIREMENTS

This curriculum ensures that all students gain knowledge and skill areas specific to the pharmaceutical sciences, through the core courses. Additionally, the core courses are taken during the first year and allow students the opportunity to perform research in faculty laboratories, such that students will be well positioned to select a dissertation advisor. Depending upon their specific research interests, students choose from a menu of departmental and campus offerings of courses,

including technique courses. Departmental course offerings are described in detail in the "Program Course Descriptions" section of this catalog.

A student typically graduates after five years in the PhD program. In the first two years, students focus on completing classroom requirements and initial dissertation research. Early in the third year, students take the comprehensive examination, where each student demonstrates mastery of relevant coursework and proposes dissertation research. In the last three years, students focus on laboratory experimentation and the presentation of a dissertation.

The minimum course requirements of the PhD degree program are as follows:

Core Course Curriculum

COURSE	CREDITS
PHAR 600 and 601—Pharmaceutical Drug Design and Development	3 each
PHAR 608—First-Year Rotations	1
PHAR 708—First-Year Seminar	1
Two techniques courses	4 minimum
Ethics course (e.g., DOCB 605—Scientific Method, CIPP 909—Responsible Conduct of Science)	
Minimum three additional courses	
Three seminar presentations	
PHAR 899—Thesis Research	12

FACULTY RESEARCH AREAS

- Larry L. Augsburger, pharmaceuticals; solid oral dosage form design
 Gary G. Buterbaugh, pharmacology of epileptic seizures
 Andrew Coop, organic and medicinal chemistry; opioid and sigma receptors
 Richard N. Dalby, respiratory drug delivery; metered dose inhalers (MDIs); dry powdered inhalers (DPI); nebulizers
 Russell J. DiGate, genetics; DNA topoisomerase III
 Natalie D. Eddington, pharmacokinetics; brain delivery; pharmacodynamic relationships
 Hamid Ghandehari, controlled drug delivery; polymers; biomaterials
 Ronald D. Guiles, protein structure, including Heme and human interleukin-5; nuclear magnetic resonance
 Jun Hayashi, cell biology; lymphocyte signal transduction
 Stephen W. Hoag, pharmaceuticals; controlled release tablets; power technology
 R. Gary Hollenbeck, physical pharmacy; novel drug delivery systems
 Kwang Chul Kim, cell biology; epithelial cell surface mucins (MUC1 mucins)
 Alexander D. MacKerell, Jr., computational chemistry; novel inhibitors of HIV integrase

J. Edward Moreton, pharmacology; behavioral and neuropharmacological aspects of drug abuse
James E. Polli, oral biopharmaceutics; bioavailability; intestinal permeability
Gerald M. Rosen, free radicals in biological systems; host immune response
Ginette Serrero, cancer; obesity; adipocyte differentiation
Paul S. Shapiro, signal transduction; mitogen-activated protein (MAP) kinase pathways
Rakesh K. Srivastava, cell growth, differentiation and apoptosis; Bcl-2 family members
Daniel J. Sussman, signal transduction; proto-oncogene Wnt-1 (int-1)
Ashiwel S. Undie, signal transduction; phospholipase C-dependent signal transduction; dopamine
Jia Bei Wang, neurotransmitter receptors; mu opiate receptor
Myron Weiner, drug metabolism; cytochrome P450; hepatocytes
Angela Wilks, protein structure and function; heme proteins; *Shigella dysenteriae*

ACADEMIC RESOURCES

Extramural funding for research is currently in excess of \$4 million dollars, and ongoing investigations include collaborative projects with other researchers on campus and at nearby institutions such as the National Institutes of Health, U.S. Food and Drug Administration, the Walter Reed Army Institute of Research, and the pharmaceutical industry.

The Department of Pharmaceutical Sciences is equipped with modern chemical instrumentation, including ultraviolet-visible spectrometers, a Fourier-transform infrared spectrometer, a 300-MHZ NMR spectrometer, several mass spectrometers, gas and high-performance liquid chromatography systems, radioactivity counters, high-speed centrifuges, and molecular modeling workstations. Wet laboratories, cell culture facilities, and computer laboratories are designed for research in organic drug synthesis, drug design, gene and protein structure and function elucidation, molecular biology, molecular and tissue pharmacology, microbiology, drug metabolism and pharmacokinetics, and drug product design.

The department also has one of the most modern industrial and pharmaceutical technology research and manufacturing facilities in the country, including a Good Manufacturing Practice facility. It has small-scale and pilot-scale equipment for the production of pharmaceuticals. There is also a state-of-the art analytical facility, which is a focal point for basic and applied pharmacokinetic research and which plays a major role in enabling faculty to conduct clinical research in hospitalized patients. The laboratory is equipped to handle all phases of a drug's absorption and disposition in animals and/or humans.

FINANCIAL SUPPORT

Financial support is available to students accepted into the program, such that students can focus on graduate studies. Support includes a stipend (currently \$18,000 for year 2001 for Step I pre-candidates and \$19,000 for Step II candidates), tuition, health, and fees. Additional merit awards are given to the department's most outstanding students.

Competitive departmental fellowships are awarded by the department each year: Dunning Fellowship, Emerson Fellowship, Slama Graduate Award, and the Shangraw/Center for Professional Advancement Scholarship. Additionally, many students each year earn external fellowships, through excellence in academics and research.

GRADUATE STUDENT ORGANIZATIONS

Graduate students play a particularly active role in a number of campus student organizations. Additionally, two graduate student organizations within the School of Pharmacy and the Department of Pharmaceutical Sciences are the Pharmacy Graduate Student Association and a student chapter of the American Association of Pharmaceutical Sciences. Moreover, depending upon their specific research interests, individual students often join national professional societies, many of which host meetings and workshops in the mid-Atlantic region.



Pharmacy students enjoy the outdoors.

Financial Information

The School's tuition and fees, health insurance, residency status, and financial aid information is as follows:

TUITION AND FEES

The following lists the tuition and fees for the 2001–2002 academic year. The tuition per credit hour rate below is for the Nontraditional PharmD Pathway and graduate programs only. Students in these programs are charged this rate regardless of the number of credit hours they take.

TUITION	FULL-TIME	NTPD	GRADUATE
Full time (9 or more credits)			
Resident	\$ 7,576		
Nonresident	\$15,642		
Per credit hour rate			
Resident		\$296	\$281
Nonresident		\$532	\$503
Fees			
Student Government Association	\$ 15	\$ 15	\$ 15
Transportation	\$ 27	\$ 27	\$ 27
Student activities	\$ 50	\$ 50	\$ 45
Supporting facilities	\$ 350	\$318	\$318
Other Expenses			
Clinical clerkship (experiential courses)	\$ 300	\$300	
Application fee (nonrefundable)	\$ 60	\$ 60	\$ 50
Admission acceptance deposit (nonrefundable)	\$ 800		
Late registration fee	\$ 40	\$ 40	\$ 40
Diploma fee	\$ 50	\$ 50	\$110
Liability insurance	\$ 11	\$ 11	
Disability insurance	\$ 23		
Hepatitis B vaccine (1st year only)	\$ 160		
Continuing education certification	\$ 100		
Late payment of tuition and fees*	\$ 100	\$100	\$100

*Late payment of tuition and fees is \$100 or 5% of the balance, whichever is less.

The School reserves the right to make changes in requirements for admission, curriculum, standards for advancement and graduation, fees, and rules and regulations.

HEALTH INSURANCE

University or equivalent health insurance coverage is required of all full-time students. Students will be billed for health insurance unless they provide proof of similar coverage to the Office of Student and Employee Health. If students provide documentation, the cost of the premium is waived. The cost of health insurance varies depending on the type of coverage. For the 2001–2002 academic year, the cost for student-only coverage is \$1,129; student and spouse, \$2,710; student and child \$2,146; and student and family \$3,388.

DETERMINATION OF IN-STATE RESIDENCY

The Office of Records and Registration makes an initial determination of residency status for admission and tuition when students apply for admission. The determination made at that time, and any determination made thereafter, shall prevail for each semester until the student changes the status. Students classified as in-state residents are responsible for notifying the Office of Records and Registration in writing within 15 days of any change in their circumstances which might in any way affect their classification at the University. Students may obtain a copy of the University's policy on in-state residency status from the office listed above.

PHARMD STUDENT FINANCIAL AID

Student financial aid programs are centrally administered by the Office of Student Financial Aid. These programs are designed to help students who otherwise would be unable to attend the University. Aid packages for students often include a combination of loans, grants, scholarships, and work-study designed to meet students' needs. To qualify for aid, students must apply annually and meet the eligibility requirements. Also, **students must complete the required financial aid application forms and are encouraged to do so by February 15**. For more information about financial aid and to obtain application forms, call 410-706-7347 or write to: Student Financial Aid, University of Maryland, Baltimore Student Union, Room 334, 621 W. Lombard St., Baltimore, MD 21201.

SCHOOL OF PHARMACY SCHOLARSHIPS

Through the generous gifts of alumni, friends, and professional associations, the School provides additional financial aid to its full-time students who are in need of financial support. Students do not apply for these awards. Students who receive most awards are those who can document unmet financial need through the student financial aid process. Some scholarships support students from certain geographical areas. The School has established the following scholarships:

April Adams Memorial Scholarship. The students, faculty, and friends of April Adams established this scholarship as a lasting tribute to Adams, Class of 1999. The scholarship, symbolizing her dedication and love of pharmacy, will be awarded to deserving students in her name.

Marilyn I. Arkin Scholarship Fund. The family and friends of Marilyn I. Arkin, daughter of Ann and Morris Arkin and a member of the Class of 1975, established this scholarship as a memorial in 1988. The scholarship provides support for professional students in the School of Pharmacy.

Caspari Memorial Fund. Alumni and friends of Professor Charles Caspari, Jr., former dean of the School of Pharmacy, established this scholarship November 25, 1917, to support a deserving student who has financial need.

Centennial Research Fund. This fund was established September 13, 1946, with contributions from the Centennial Research Fund campaign launched in 1941 to commemorate the 100th anniversary of the School of Pharmacy. The students who receive this fellowship do research in the following fields: pharmacy, pharmaceutical chemistry, pharmacology, microbiology, and pharmacognosy.

H.J. (Jack) Custis, Jr., Memorial Scholarship Fund. In memory of H.J. (Jack) Custis, Jr., Class of 1951, a fund was established to award scholarships on the basis of reasonable need and academic ability to students in the professional program of the School of Pharmacy. Students must be residents of one of Maryland's nine Eastern Shore counties to be eligible for the Custis Memorial Scholarship.

H.A.B. Dunning Fellowship Fund. This fund was first established from annual donations beginning in 1930 and endowed in 1963 by bequest to the School of Pharmacy from Dr. H.A.B. Dunning, distinguished alumnus of the School and prominent Baltimore manufacturing pharmacist. This fellowship is open to promising graduate students doing research in pharmaceutical chemistry.

Isadore M. and Irene R. Fischer Memorial Scholarship Fund. The families of Isadore M. and Irene R. Fischer have provided a scholarship fund to support a professional or graduate student demonstrating academic excellence in the educational programs of the University of Maryland School of Pharmacy.

Charles L. Henry Memorial Scholarship Fund. The Charles L. Henry Memorial Scholarship Fund has been provided for PharmD students in the School of Pharmacy requiring financial assistance.

L. Louis and Elinor Hens Memorial Scholarship Fund. Established in 1990 by Mrs. Elinor Hens in memory of her husband, this fund is used to support deserving students who have financial need.

Dr. Paul Jablon Research Award. Mr. Leon Jablon and the late Mrs. Yetta Jablon established this award in January 1985 in memory of their son, Dr. Paul Jablon. The research award is given to students displaying exceptional promise in the field of pharmaceuticals.

J. Gilbert Joseph Scholarship. In memory of her brother, J. Gilbert Joseph, a former student of the School of Pharmacy, the late Miss Jeanette Joseph provided a generous bequest to endow scholarships to be awarded to qualified students who have maintained a superior scholastic average and who are in need of financial assistance.

Frederick William Koenig Memorial Scholarship. In memory of her husband, Frederick William Koenig, a practicing pharmacist for 50 years, the late Mrs. Valeria R. Koenig has bequeathed a sum of money to endow a scholarship to be awarded annually. The recipient of the award will be selected on the basis of financial need, character, and scholarship.

The Bernard Lachman Memorial Scholarship Fund. The family, friends, and colleagues of Bernard Lachman established this fund in 1999 in his memory. The scholarship is used to support students who have financial need.

Dr. Dean E. Leavitt Memorial Scholarship Fund. In honor of Dr. Dean E. Leavitt, associate dean for administration and professional services, 1976–1989, the family and the faculty established a fund to support a scholarship covering the final year of pharmacy school for students who have attained at least a cumulative average of 3.0, who have shown superior aptitude and enthusiasm in the course sequence in management, and who have demonstrated, as Dean Leavitt did, a commitment to the qualities of health and humanitarianism, both personally and professionally.

A.M. Lichtenstein Scholarship. In memory of her husband, A.M. Lichtenstein, distinguished alumnus of the School of Pharmacy, Class of 1889, the late Mrs. Francina Freese Lichtenstein bequeathed a sum of money to endow an annual scholarship to a resident of Allegheny County, Md. The recipient of the award is to be selected on the basis of financial need, character, and scholarship.

The Dr. L. Lavan Manchey Scholarship Fund. This fund was established July 8, 1997, in memory of L. Lavan Manchey, PhD, Class of 1926, and winner of the Simon Gold Medal for proficiency in practical chemistry in 1928. The scholarship is used to support students who have financial need.

Aaron and Rosalie Paulson Scholarship Fund. Established by Mr. Aaron A. Paulson, Class of 1924, and his late wife, Rosalie, this endowed scholarship supports a first professional year student with demonstrated financial need.

Plough Pharmacy Student Scholarships. The Plough Foundation, created by Abe Plough, founder of Plough Inc., and the School of Pharmacy contributed funds to an endowment that provides financial support to pharmacy students. The funds are awarded on the basis of financial need, academic achievement, leadership, and citizenship.

Leonard Rodman Dean's Scholarship Fund. Established in March 2001 by Mr. Leonard Rodman, this fund is used to provide scholarship to support students who have financial need.

Milton C. And Elizabeth C. Sappe Scholarship Fund (Formerly the Milton Charles Sappe Scholarship Fund). Elizabeth Sappe established this scholarship in December 1995. The scholarship is used to support students who have demonstrated financial need, high academic standing, and are residents of Maryland.

Joseph Sokol Memorial Scholarship. In memory of Joseph Sokol, Class of 1973, his family and friends established this scholarship to provide support for deserving students who have financial need.

Arthur Schwartz Memorial Scholarship Fund. The family and friends of Arthur Schwartz, BS Pharm 1979, PhD Pharmacy Administration 1987, have established an endowed scholarship fund for a graduate student in Pharmacy Administration to honor his memory.

Dr. Frank J. Slama Fellowship Fund. Established in April 1996 from the estate of Lillian Slama, in memory of her husband, Dr. Frank J. Slama, this fellowship supports one or more annual award(s) for graduate students studying medicinal chemistry and/or pharmacognosy.

LOAN FUNDS

Students in financial need may apply for the School loans described below. For more information, contact the associate dean for student affairs.

Rose Hendler Memorial Fund. L. Manuel Hendler and family have established a loan fund in memory of Mrs. Rose Hendler for needy students. Loans from this fund are available to qualified students.

Louis T. Sabatino Memorial Student Loan Fund. In honor and memory of her late brother, Louis T. Sabatino, Class of 1939, Mrs. Marie Sabatino DeOms has established this fund to provide loans to deserving students.

Benjamin Schoenfeld Memorial Pharmacy Loan Fund. The family of Mr. Benjamin Schoenfeld, Class of 1924, has established a loan fund as a memorial to him. This fund is available to qualified needy students. Loans are made upon the recommendation of the dean.

Burroughs-Wellcome Emergency Loan Fund. The Burroughs-Wellcome Co. established a fund to provide short-term (two months) loans to students in financial need.

VETERANS FINANCIAL AID

New students, including Nontraditional Pathway students, who are eligible for educational benefits through the Veterans Administration should forward a completed *VA Form 22-1995: Request for Change of Program or Place of Training* to the Office of Student Affairs. Veterans who have not used any of their VA educational benefits should forward a completed *VA Form 22-1990: Application for Program of Education or Training* and a copy of *DD 214: Separation Papers* directly to the Office of Student Affairs of the School of Pharmacy.

PHD STUDENT FINANCIAL AID

For information on financial support, graduate students should contact the graduate department to which they are applying.

PharmD Academic Policy Statements

The School reserves the right to make changes in standards for advancement and graduation and rules and regulations. The following academic policy statements shall not be construed as a contract between any student and the School:

ACADEMIC SESSIONS

The School of Pharmacy operates on a four-semester calendar. The fall term, four months long, begins the last week of August and runs to the Christmas recess. A three-week winter minimester in January allows students to avail themselves of tutorial services or elective courses. The spring term, four months long, begins the last week in January and extends to just before Memorial Day. Full-time students enrolled for the spring semester do not pay tuition and fees for campus courses they take during the January minimester. Student must pay additional minimester tuition at other University System of Maryland (USM) campuses. The School does not offer any courses during the summer session. Students may take didactic courses at USM institutions but must pay summer session tuition and fees at those institutions.

REGISTRATION POLICIES

CANCELLATION OF REGISTRATION

Students who register and subsequently decide not to attend the School of Pharmacy *must provide written notice* to the Office of Student Affairs on or before the first day of class. If this office has not received a request for cancellation by 5 p.m. on or before the first day of instruction, the University will assume that students plan to attend and that they accept their financial obligation.

CHANGE IN REGISTRATION

Students should obtain and return the completed *Add/Drop Form*, used for all changes in registration, to the School's Office of Student Affairs. Students are not charged for a change in registration. Students may not add a course after the first week of classes or drop a course after eight weeks into the semester. Students will receive the grade of *F* for courses dropped after the eighth week of classes without approval.

LATE REGISTRATION

Students who fail to complete registration by the specified time for regular registration, usually the day before the first day of classes, pay a late registration fee. (See the "Financial Information" section of this catalog for fee amount.)

WITHDRAWAL FROM THE UNIVERSITY

Students who withdraw from the University before the end of a semester are eligible for partial refunds, depending upon the date of withdrawal. To ensure such refunds, students must file withdrawal forms in the School's Office of Student Affairs. Students who fail to complete these forms will receive failing grades in all courses and forfeit their right to any refund.

GRADING SYSTEM

When, for any reason, a student repeats a course, the grade achieved in the repeated course replaces all previous grades in the same course. The School of Pharmacy uses the following grading system:

GRADE	INTERPRETATION	POINT VALUE
A	Excellent	4
B	Good	3
C	Fair	2
D	Poor but Passing	1
P	Pass	0
F	Failure	0
I	Incomplete	Must be replaced by definite grade within one year
WD	Withdrawal	No grade is assigned

ACADEMIC STATUS POLICIES

Students' performance in didactic and experiential learning courses is continually monitored. Students are responsible for their academic progress and should take the initiative to meet their academic advisor and/or the coursemaster(s) when academic problems occur. The director for student services, the class advisor, faculty, and administration are available to help students meet the School's academic standards. Experience has demonstrated that the earlier and more actively students recognize and address potential problems, the greater their likelihood of

avoiding academic difficulties. By the same token, faculty members are encouraged to initiate discussions with students whose performance appears likely to result in a failing grade.

To remain in acceptable academic standing and to be eligible for graduation, students must maintain a minimum cumulative GPA of 2.0 in required courses. Students with a cumulative GPA below 2.0 or a failing grade in a didactic or experiential learning course are subject to academic dismissal.

At the end of each semester, the associate dean of student affairs reviews the academic status of all students in the PharmD program. Students with a failing grade in any course are subject to academic dismissal as soon as the failing grade is submitted in writing to the Office of Student Affairs. Students who do not achieve a minimum cumulative GPA of 2.0 in their required courses are subject to academic dismissal.

Students who have a semester GPA below 2.0 but maintain a cumulative GPA of 2.0 or greater will receive a letter of academic warning from the associate dean of student affairs. The chair of the Student Affairs Committee and students' academic advisors also receive a copy of this letter.

The associate dean of student affairs will send a notification letter and a copy of the Academic Status Policies and Procedures to students subject to academic dismissal. The letter will indicate that the student will be dismissed from the School unless he or she appeals to the Student Affairs Committee requesting to be placed on academic probation. The letter will state the time and place of the academic review hearing with the Student Affairs Committee (typically, within seven calendar days of the letter's date). The chair of the Student Affairs Committee and students' academic advisors also receive copies of the letter.

Students subject to academic dismissal have the right to appeal to the Student Affairs Committee. Students may present their case in person before the committee or submit a written appeal. Students may submit any documents that they deem pertinent. Students who do not appeal will be dismissed from the School.

At least seven calendar days before any Student Affairs Committee academic review hearing, the committee will distribute a confidential memo to the faculty, listing all students to be reviewed. The memo will state the time and place of the hearing, stress the confidential nature of the information, and request that faculty provide the committee with pertinent information on students' academic performance and ability. Any faculty member may provide written comments to the committee or request permission to appear at any student's hearing.

Academic advisors and other faculty members may attend academic review hearings and present pertinent information. The committee will consider prepharmacy grades, prior academic performance in the School, and personal issues in its deliberations.

At the conclusion of the academic review hearing, the committee will deliberate on each case and determine each student's academic status. The committee decides by a simple majority vote to either academically dismiss students, place them on academic probation, or gather more information. If placed on academic probation, students will be allowed to continue in the program but under specific terms outlined by the committee, such as taking remedial courses to strengthen

specific knowledge or skills. If the committee decides to gather more information, it must complete its review and make a final decision within five calendar days of the original hearing. The committee will submit its decision in writing to the students, dean, and the students' academic advisors within seven calendar days of the academic review hearing.

Students have the right to appeal the decision of the Student Affairs Committee directly to the dean. Students must submit appeals in writing and state the basis for the appeal. Students must complete all appeals before the beginning of the next semester. The dean's decision is final.

Students on academic probation must meet with their academic advisor and the associate dean of student affairs to develop a plan of action to resolve all pertinent academic issues. While on probation, students must earn a GPA of 2.0 or greater during each semester. If students on probation earn a semester GPA of 2.0 or greater, but the cumulative GPA or the required-course GPA remains below 2.0, students will remain on academic probation. Students will be removed from probation when their cumulative GPA and required-course GPA is 2.0 or greater. Students with a failing grade on their record will remain on probation until they receive a passing grade.

Students who are academically dismissed may petition the Admissions Committee for readmission after they have completed some form of remediation. Students who have been academically dismissed twice from the School are not eligible for readmission.

ACADEMIC INTEGRITY POLICIES AND PROCEDURES

Students are entering a profession highly trusted by the public. Therefore, students are expected to "maintain the highest principle of moral, ethical, and legal conduct." (Oath of a Pharmacist, 1999.) Students and faculty developed the policies and procedures described below to help maintain the School's high standard of conduct.

STUDENT HONOR CODE

Students entering the profession of pharmacy are required to exhibit exemplary standards of conduct. Absolute honesty is imperative for a health professional. On May 14, 1998, the Student Government Association adopted the following *Honor Code*.

I. Statement of Philosophy

The students of the University of Maryland School of Pharmacy recognize that honesty, truth, and integrity are values central to the School's mission as an institution of higher education. Therefore, the Student Government Association has assembled current policies and procedures involving academic integrity into this *Honor Code* of behavior. The code described in this document articulates the

responsibilities of Doctor of Pharmacy students, graduate students, faculty, and administration in upholding academic integrity, while at the same time respecting the rights of individuals to the due process offered by administrative hearings and appeals. All persons enrolled in any course or program offered by the University of Maryland School of Pharmacy and all persons supervising the learning of any student are responsible for acting in accordance with the provisions of this policy.

Students' Responsibilities

- Understanding the types of conduct which are deemed unacceptable and, therefore, are prohibited by this policy.
- Refraining from committing any act of cheating, plagiarizing, facilitating academic dishonesty, abusing academic materials, stealing, or lying.
- Reporting every instance in which the student has a suspicion or knowledge that academic conduct which violates this policy or its spirit has taken place to the faculty member responsible for instruction or to a member of the Student Discipline and Grievance Committee.

Faculty Responsibilities

- Understanding the procedures of this policy relative to how faculty are to handle suspected instances of academic dishonesty.
- Developing an instructional environment that reflects a commitment to maintaining and enforcing academic integrity.
- Handling every suspected or admitted instance of the violation of the provisions of this policy in accordance with the current School and University procedures.

II. Academic Integrity

In attempt to maintain academic integrity, the Student Government Association has outlined a code of conduct (an Honor Code) which describes acceptable behavior for students in all its academic settings. This code has been developed using University (as stated in the University's *Student Answer Book*) and School (as stated in the School's catalog) policies. Elements of this code can be categorized into six broad areas:

1. **Cheating** Definition: Using or attempting to use unauthorized materials, information, notes, study aids or other devices, or obtaining unauthorized assistance from any source for work submitted as one's own individual efforts in any class, clinic, assignment, or examination. Examples of cheating include, but are not limited to, the following actions:
 - a. Copying from another student's paper or test, or receiving assistance from another person during an exam or other assignment in a manner not authorized by the instructor.
 - b. Possessing, buying, selling, removing, receiving, or using at any time or in any manner not previously authorized by the instructor a copy or copies of any exam or other materials (in whole or in part) intended to be used as an instrument of evaluation in advance of its administration.

- c. Using material or equipment not authorized by the instructor during a test or other academic evaluation, such as crib notes, a calculator, or a tape recorder.
 - d. Working with another or others on any exam, take home exam, computer or laboratory work, or any other assignment when the instructor has required independent and unaided effort.
 - e. Attempting to influence or change an academic evaluation, grade or record by deceit or unfair means, such as: 1) damaging the academic work of another student to gain an unfair advantage in an academic evaluation; or 2) marking or submitting an exam or other assignment in a manner designed to deceive the grading system.
 - f. Submitting, without prior permission, the same academic work which has been submitted in identical or similar form in another class or in fulfillment of any other academic requirement at the University.
 - g. Permitting another to substitute for oneself during an exam or any other type of academic evaluation.
 - h. Gaining an unfair advantage in an academic evaluation by receiving specific information about a test, exam, or other assignment.
2. **Plagiarism** Definition: Representing, orally or in writing, in any academic assignment or exercise, the words, ideas, or works of another as one's own without customary and proper acknowledgment of the source. Examples:
- a. Submitting material or work for evaluation, in whole or in part, which has been prepared by an individual(s) or commercial service.
 - b. Directly quoting from a source without the customary or proper citation.
 - c. Paraphrasing or summarizing another's work without acknowledging the source.
 - d. Downloading material from Web sites without appropriate documentation.
3. **Facilitating Academic Dishonesty** Definition: Helping or attempting to help another person commit an act of academic dishonesty. Examples:
- a. Providing assistance to another during an exam or other assignment in a manner not authorized by the instructor.
 - b. Acting as a substitute for another in any exam or any other type of academic evaluation.
 - c. Providing specific information about a recently given test, exam, or other assignment to another student who thereby gains an unfair advantage in an academic evaluation.
 - d. Permitting one's academic work to be represented as the work of another.
 - e. Preparing for sale, barter, or loan to another such items as unauthorized papers, notes, or abstracts of lectures and readings.
4. **Abuse of Academic Materials** Definition: Destroying or making inaccessible academic resource materials. Examples:

- a. Destroying, hiding, or otherwise making unavailable for common use library, computer, or other academic reference materials.
 - b. Destroying, hiding, or otherwise making unavailable another's notes, experiments, computer programs, or other academic work.
5. **Stealing** Definition: Taking, attempting to take, or withholding the property of another, thereby permanently or temporarily depriving the owner of its use or possession. Examples:
- a. Unauthorized removal of library materials, examinations, computer programs, or any other academic materials, including obtaining advance access to an examination through collusion with a University employee or otherwise.
 - b. Taking another's academic work, such as papers, computer programs, laboratory experiments, or research results.
6. **Lying** Definition: Making any oral or written statement which the individual knows to be untrue. Examples:
- a. Making a false statement to any instructor or other University employee in an attempt to gain advantage or exception.
 - b. Falsifying evidence or testifying falsely, such as in a Student Grievance Committee hearing.
 - c. Inventing or counterfeiting data, research results, research procedures, internship or practicum experiences, or other information.
 - d. Citing a false source for referenced material/data.

III. Honor Pledge

In order to address the first two areas, cheating and plagiarism, the School has developed an honor pledge statement that has been used by many faculty members to reinforce the importance of academic integrity. This pledge statement will be used in the following manner: Work assigned for classes, clinics, internships, and all other types of instruction offered at the School of Pharmacy may be accomplished in either of two ways: (1) as "individual" work for which the student will sign a pledge statement indicating that the work was completed independently, without giving or receiving assistance from another; or (2) as "collaborative" work, which may be completed in collaboration with others as directed by the instructor and for which no pledge statement is required. All work is considered to be individual work unless the instructor specifies otherwise. For all "individual" work, instructors may require students to sign the following pledge statement:

"On my honor, I have neither given nor received aid on this assignment."

Student's signature: _____ Date: _____

Thus, students will state that the work that was submitted is their own and will be held accountable if evidence appears that is contrary to this statement. Students are reminded that neither the presence nor the absence of a signed pledge statement will allow students to violate established codes of conduct as described above.

IV. Disciplinary Procedures

As stated below, the Student Discipline and Grievance Committee will be responsible for implementing and monitoring aspects of this code for Doctor of Pharmacy students. A separate set of procedures is in place for graduate students. They should contact their graduate program director for further information. PharmD students who are found guilty of a violation of academic integrity standards will be subject to penalties deemed appropriate by the Student Discipline and Grievance Committee as stated in the committee's policies and procedures. It is the committee's duty to protect honest students from being taken advantage of by those who behave dishonestly. The committee will ensure any accused student of certain rights: to be informed in writing of the charges, to hear evidence presented, to question witnesses, and to present witnesses. The committee shall maintain confidentiality regarding names of persons involved in honor cases. The principles and problems raised by cases, however, may be discussed with appropriate administrative and faculty representatives.

STUDENT DISCIPLINE AND GRIEVANCE COMMITTEE

I. Purpose

The Student Discipline and Grievance Committee ("committee") is established in the School of Pharmacy to foster the self governance of the student body. The committee hears and attempts to solve problems or complaints ("grievances") that involve professional students. Grievances against graduate students or faculty members are handled under separate policies and procedures.

Most grievances are brought directly to the committee. However, some incidents involving students may be resolved outside the formal grievance process. Students and faculty members are encouraged to consult with the director of student services who will serve as an ombudsman for the potential grievants and may triage the issues to appropriate parties. These initial meetings will be held in confidence to encourage disclosure. Potential grievants (either faculty members or students) will receive a list of options that are available to them in order to resolve issues (see Appendix A). If desired, potential grievants may request a Preliminary Evaluation by members of the committee (see *Part IV: Preliminary Evaluation*) in order to assess whether or not the situation is grievable. Students and faculty members may file a formal grievance with the committee at any time for issues outlined in *Section III: Grievances*.

In certain situations, the dean or any of the associate deans can enforce administrative dismissal or probation for just cause in situations involving criminal activity, potential injury to members of the School's community, or other actions that demand an immediate action. Due to confidentiality issues, the administration may not be able to share specific details of the situation until a formal grievance is filed with the committee. The committee will review these emergency situations in a timely manner and will conduct formal hearings to determine long-term courses of action for the accused.

II. Committee Composition

The Student Discipline and Grievance Committee, a sub-committee of the Student Affairs Committee, is composed of seven voting members: four students and three faculty members. The student members of the committee include the Student Government Association (SGA) president, the second- and third-year class presidents, and the most senior student member of the Student Affairs Committee. If a grievance is made against a Nontraditional PharmD (NTPD) Pathway student, an NTPD student will replace the most senior student member of the Student Affairs Committee. Faculty members include the SGA faculty advisor and the third- and fourth-year class advisors. The SGA president chairs the committee. The associate dean for student affairs serves as an ex-officio member. In the event that a grievance is filed against an NTPD student, the NTPD pathway director will serve as an ex-officio member of the committee.

All members of the committee must be present at formal hearings. Members of the committee who cannot attend the hearing or must recuse themselves due to a conflict of interest will notify the chair immediately. In the event that a committee member cannot attend a formal hearing, the committee chair shall appoint a replacement. Each student member of the committee unable to attend will be replaced by an elected officer in the SGA or a member of the NTPD advisory board. Each faculty member of the committee unable to attend will be replaced by a faculty member, preferably a member of the Student Affairs Committee.

III. Grievances

A student, a group of students, or a faculty member ("grievant") may bring a grievance against a student or a group of students ("respondent") for any act that is unethical or causes injury or damage. Grievances may include, but are not limited to acts of discrimination based on race, age, gender, ethnicity, religion, sexual orientation, marital status, physical or mental handicap; violations of academic integrity; violations of University or School policies (see School of Pharmacy catalog); lewd, obscene, or disruptive behavior on University premises or at University-supervised activities; sexual harassment; threatening or abusive communication to members of the University community; intentionally initiating any false report or threat of fire, explosion, or other emergency; violations of Baltimore City, state, or federal law.

IV. Preliminary Evaluation

A grievance must be submitted in writing to the SGA president, the SGA advisor, or the association dean of student affairs. Within five days of receipt of a written grievance, the SGA president, the SGA advisor, the associate dean for student affairs, and either the most senior student member of the Student Affairs Committee or an NTPD student (as applicable) will review the facts presented and determine if the matter is grievable under this policy. If two or more individuals during the preliminary evaluation believe the matter is grievable, a formal hearing will be called by the committee chair. If the majority believe the matter is not grievable, the associate dean for students affairs will counsel the grievant on alternatives.

V. Grievance Procedure

Once the grievance is determined to be grievable, the respondent will be sent a letter from the committee chair and the associate dean of student affairs stating: 1) that a formal grievance has been filed; 2) the deadline for submission of a written rebuttal and a proposed date(s) for the formal hearing; and 3) advice and counsel should be sought from the academic advisor. Along with the letter, the respondent will be provided with a written copy of the grievance and this policy. The respondent will be given up to 10 days to provide a written response to the committee chair. The committee will hold a formal hearing no more than five days after the deadline for receipt of the respondent's written response.

Prior to the hearing, the grievant's allegations and any supporting information will be provided to the respondent for review. Likewise, the respondent's allegations and evidence shall be provided to the grievant for review. The associate dean for student affairs will facilitate this exchange of information. If feasible, supporting evidence will be made available to both parties no less than three days before the scheduled hearing.

The formal hearing is an internal academic process; legal counsel will not be permitted to represent either the grievant or the respondent. The grievance is presented to the committee by the grievant or by a representative of the dean's office, in the presence of the respondent. The presenter of the grievance may call witnesses to present relevant information. The witnesses supporting the grievant may be questioned by the respondent and committee members.

The respondent has the right to refuse to appear before the committee and the right to remain silent during the hearing. Refusal to appear will not be taken as an admission of guilt. The respondent has the right to: 1) present a statement in the respondent's own behalf at the hearing; 2) present witnesses having relevant information pertaining to the grievance; and 3) present relevant evidence in the form of written or tangible materials. The witnesses supporting the respondent may be questioned by the grievant and committee members.

The hearings will not be open to the public. All witnesses will be excluded from the hearing room until they are called to testify. All witnesses will be asked to affirm that any information they are presenting, including any written materials, is accurate and complete to the best of their knowledge and belief.

Upon completion of the hearing, the committee will meet in closed session to determine whether the grievance has been proven by the preponderance of the evidence; that is, whether on the basis of the evidence, it is more likely than not that the grievance is a correct allegation. The chair will remind the committee that it is to be free of bias concerning all aspects of the case in question. Members who wish to excuse themselves from the voting due to possible bias may do so.

The method of voting shall be by secret ballot. To sustain the grievance, a majority vote of both the faculty and student committee members is required. All other questions before the committee may be decided by a simple majority vote.

If the vote is that a grievance is not sustained, the case is closed. A record of the case will be kept in the committee's files until the respondent leaves the University. If a grievance is sustained, the committee will decide on a course of action.

VI. Course of Action

Following a vote sustaining a grievance against a respondent, the committee must take one of the following courses of action:

1. Prepare a disciplinary letter stating that the respondent acted with impropriety. This letter is not entered into the student's file but is retained in the committee's file until the student has left the School. The letter will be sent to the respondent within three days of the Grievance Committee hearing. A copy of said letter will be sent to the grievant.
2. Prepare a temporary letter of censure to remain in the student's file for at least one year. The respondent and grievant will be informed in writing within three days of the Grievance Committee's action.
3. Prepare a letter of censure to remain in the student's file permanently. The respondent and grievant will be informed in writing within three days of the grievance committee's action.
4. Recommend to the Student Affairs Committee that the respondent be placed on disciplinary probation, not to exceed one year.
5. Recommend to the Student Affairs Committee that the respondent be suspended from the School for a period of time not to exceed one year.
6. Recommend to the Student Affairs Committee that the respondent be dismissed from the School.

In addition to the actions stated above, the committee may place other requirements on the respondent that relate to the case (e.g., to make restitution or repairs when property is damaged, to seek counseling for emotional issues).

VII. Appeal to the Dean

A respondent or grievant may appeal any recommended action to the dean. The appeal must be made in writing and must be filed in the dean's office. The appeal should describe the basis for the appeal. The appeal must be based on new evidence or relevant facts not produced in the hearing; a claim of inadequate consideration of specific evidence; a claim that a rule or regulation of the University or School applied in the case is not applicable; or a claim that the disciplinary action is unduly severe or lenient.

After reviewing the Grievance Committee's report, the recommendation from the Student Affairs Committee, and any appeal(s) from the respondent or grievant the dean will make a final decision to accept the recommendation or remand the matter for reconsideration to the Grievance Committee. The dean will generally make a final decision within 14 days after receiving the Student Affairs Committee's recommendation and the Grievance Committee's report. If the appeal is denied, the dean's action is final.

VIII. Administrative Issues

1. Once the grievance process is completed, including any appeal, a record of the case will be kept in the dean's office. The names of the grievant and respondent and the facts of the case will be kept strictly confidential by members of the committee. At the end of each academic year, the

chair of the Student Affairs Committee will write an annual report summarizing the activity of the Grievance Committee. The report will be submitted to the dean and the Faculty Assembly.

2. Grievances will be handled as swiftly as possible. The times set forth in this policy are calendar days. Due to the academic schedule, it may not be possible to observe the usual deadlines in all cases. If there is good cause in the opinion of the committee chair, the deadlines may be extended for a reasonable period. Likewise, when the outcome of a matter may relate to pending academic action (e.g., graduation), deadlines may be sooner, provided that the respondent agrees. A grievance of such severity that it might affect the respondent's eligibility to graduate will be considered on very short notice, with the respondent's consent. Otherwise, graduation will be deferred pending resolution of the matter.
3. The committee chair may exclude from consideration repetitive or irrelevant evidence.
4. Some matters may involve witnesses who are not affiliated with the School or evidence which must be obtained from parties other than the School and its students and faculty. The School will cooperate with the grievants and respondents in requesting that such information be brought into grievance procedures as appropriate. Written statements are acceptable when personal appearance is impractical. However, no grievance process shall be terminated or abandoned due to the inability of the School to compel the appearance of a witnesses or presentation of evidence. A grievance will be decided on the basis of evidence presented. Lack of witnesses or evidence will not create presumptions that the testimony and evidence would be favorable to the grievant or the respondent.
5. A grievance may involve facts that are the basis of criminal charges against a respondent. The dean will consider a request by a respondent to delay committee action, or final decision, pending the outcome of the criminal investigation. Such requests will be granted only when considered in the best interest of the School. In cases involving felony charges directly involving the School, suspension pending outcome of the criminal matter may be a condition of delaying the grievance process.
6. If placed on disciplinary probation, a student may not participate in School or University sponsored extracurricular activities or serve as an officer in any School or University organization. At the end of the disciplinary probation period, the student will be placed in good standing. If suspended, the student may apply to the dean's office for reinstatement at the end of the suspension period. A record of the disciplinary probation, suspension, or dismissal will be entered in the student's permanent transcript and file.
7. This policy does not apply to academic status within the School.

OPTIONS AVAILABLE TO STUDENTS AND FACULTY REGARDING STUDENT GRIEVANCES

Students and faculty who have witnessed an action by a student that violates the School's or University's code of conduct, have a variety of options to pursue. Grievances may include, but are not limited to acts of discrimination based on race, age, gender, ethnicity, religion, sexual orientation, marital status, physical or mental handicap; violations of academic integrity; violations of University or School policies; lewd, obscene, or disruptive behavior on University premises or at University-supervised activities; sexual harassment; threatening or abusive communication to members of the University community; intentionally initiating any false report or threat of fire, explosion, or other emergency; violations of Baltimore City, state, or federal law.

Possible actions that may be taken include the following:

1. Consulting with the director of student services regarding informal resolution of problems.
2. Filing a formal grievance in writing to the SGA president, the SGA advisor, or the associate dean of student affairs.
3. Asking another party (student, faculty member, or administrator) to file the grievance on your behalf if you feel that you do not want to file the grievance but feel compelled to act in this situation.
4. Speaking at the Discipline and Grievance Committee Hearing, or if you do not want to appear, writing a statement to be read at the hearing.
5. Seeking outside legal counsel and pursuing the case in the local or state legal system if you feel that the situation involves criminal or civil action against you by the accused.

OTHER SCHOOL POLICY STATEMENTS

The School has policy statements relating to other matters, e.g., posting, computer use, etc., listed on the Web site *www.pharmacy.umaryland.edu*.

University of Maryland

Policy Excerpts

No provision of this publication shall be construed as a contract between any applicant or student and the University of Maryland, Baltimore. The University reserves the right to change any admission or advancement requirement at any time. The University further reserves the right to ask a student to withdraw at any time when it is considered to be in the best interest of University. Admission and curriculum requirements are subject to change without prior notice.

The University publishes the full text of the following policies and additional policies and procedures in the Student Answer Book. Students who do not receive the Student Answer Book each fall should call the Office of Student Services at 410-706-7117 (Voice/TTD). The Student Answer Book is online at www.graduate.umd.edu/student/sab/introduction.html. Additional University policies are online at www.umd.edu/ppm/index.cgi.

ELIGIBILITY TO REGISTER

A student may register at the University when the following conditions are met: (1) the student is accepted to the University, (2) the student has received approval from the unit academic administrator, and (3) the student has demonstrated academic and financial eligibility.

FACULTY, STUDENT, AND INSTITUTIONAL RIGHTS AND RESPONSIBILITIES FOR ACADEMIC INTEGRITY

Preamble

The academic enterprise is characterized by reasoned discussion between student and teacher, a mutual respect for the learning and teaching process, and intellectual honesty in the pursuit of new knowledge. By tradition, students and teachers have certain rights and responsibilities which they bring to the academic community. While the following statements do not imply a contract between the teacher or the institution and the student, they are nevertheless conventions which should be central to the learning and teaching process.

I. Faculty Rights and Responsibilities

- A. Faculty members shall share with students and administrators the responsibility for academic integrity.
- B. Faculty members shall enjoy freedom in the classroom to discuss subject matter reasonably related to the course. In turn, they have the responsibility to encourage free and honest inquiry and expression on the part of students.

- C. Faculty members, consistent with the principles of academic freedom, have the responsibility to present courses that are consistent with their descriptions in the catalog of the institution. In addition, faculty members have the obligation to make students aware of the expectations in the course, the evaluation procedures, and the grading policy.
- D. Faculty members are obligated to evaluate students fairly, equitably, and in a manner appropriate to the course and its objectives. Grades must be assigned without prejudice or bias.
- E. Faculty members shall make all reasonable efforts to prevent the occurrence of academic dishonesty through appropriate design and administration of assignments and examinations, careful safeguarding of course materials and examinations, and regular reassessment of evaluation procedures.
- F. When instances of academic dishonesty are suspected, faculty members shall have the responsibility to see that appropriate action is taken in accordance with institutional regulations.

II. Student Rights and Responsibilities

- A. Students share with faculty members and administrators the responsibility for academic integrity.
- B. Students have the right of free and honest inquiry and expression in their courses. In addition, students have the right to know the requirements of their courses and to know the manner in which they will be evaluated and graded.
- C. Students have the obligation to complete the requirements of their courses in the time and manner prescribed and to submit to evaluation of their work.
- D. Students have the right to be evaluated fairly, equitably, and in a timely manner appropriate to the course and its objectives.
- E. Students shall not submit as their own work any work which has been prepared by others. Outside assistance in the preparation of this work, such as librarian assistance, tutorial assistance, typing assistance or such special assistance as may be specified or approved by the appropriate faculty members, is allowed.
- F. Students shall make all reasonable efforts to prevent the occurrence of academic dishonesty. They shall by their own example encourage academic integrity and shall themselves refrain from acts of cheating and plagiarism or other acts of academic dishonesty.
- G. When instances of academic dishonesty are suspected, students shall have the right and responsibility to bring this to the attention of the faculty or other appropriate authority.

III. Institutional Responsibilities

- A. Constituent institutions of the University System of Maryland shall take appropriate measures to foster academic integrity in the classroom.

- B. Each institution shall take steps to define acts of academic dishonesty, to ensure procedures for due process for students accused or suspected of acts of academic dishonesty, and to impose appropriate sanctions on students found to be guilty of acts of academic dishonesty.
- C. Students expelled or suspended for reasons of academic dishonesty by any institution in the University System of Maryland shall not be admissible to any other USM institution if expelled, or during any period of suspension.

Approved November 30, 1989, by the Board of Regents.

SCHEDULING OF ACADEMIC ASSIGNMENTS ON DATES OF RELIGIOUS OBSERVANCE

It is the policy of the University of Maryland to excuse the absence(s) of students that result from the observance of religious holidays. Students shall be given the opportunity, whenever feasible, to make up, within a reasonable time, any academic assignments that are missed due to individual participation in religious observances. Opportunities to make up missed academic assignments shall be timely and shall not interfere with the regular academic assignments of the student. Each school/academic unit shall adopt procedures to ensure implementation of this policy.

CONFIDENTIALITY AND DISCLOSURE OF STUDENT RECORDS

It is the policy of the University of Maryland to adhere to the Family Educational Rights and Privacy Act (Buckley Amendment). As such, it is the policy of the University (1) to permit students to inspect their education records, (2) to limit disclosure to others of personally identifiable information from education records without students' prior written consent, and (3) to provide students the opportunity to seek correction of their education records where appropriate. Each school shall develop policies to ensure that this policy is implemented.

SERVICE TO THOSE WITH INFECTIOUS DISEASES

It is the policy of the University of Maryland to provide education and training to students for the purpose of providing care and service to all persons. The institution will employ appropriate precautions to protect providers in a manner meeting the patients' or clients' requirements, yet protecting the interest of students and faculty participating in the provision of such care or service.

No student will be permitted to refuse to provide care or service to any assigned person in the absence of special circumstances placing the student at increased risk for an infectious disease. Any student who refuses to treat or serve an assigned person without prior consent of the school involved will be subject to

penalties under appropriate academic procedures, such penalties to include suspension or dismissal.

UNIVERSITY OF MARYLAND POSITION ON ACTS OF VIOLENCE AND EXTREMISM WHICH ARE RACIALLY, ETHNICALLY, RELIGIOUSLY, OR POLITICALLY MOTIVATED

The Board of Regents strongly condemns criminal acts of destruction or violence against the person or property of others. Individuals committing such acts at any campus or facility of the University will be subject to swift campus judicial and personnel action, including possible suspension, expulsion, or termination, as well as possible state criminal proceedings.

STUDENT RESIDENCY CLASSIFICATION FOR ADMISSION, TUITION, AND CHARGE-DIFFERENTIAL PURPOSES

I. Policy

It is the policy of the University System of Maryland Board of Regents to recognize the categories of in-state and out-of-state students for purposes of admission, tuition, and charge differentials at those constituent institutions where such differentiation has been established. The student is responsible for providing the information necessary to establish eligibility for in-state resident status.

Students who are financially independent or financially dependent, as defined herein, shall have their residency classification determined on the basis of permanent residency which for purposes of this policy shall be determined by the criteria set forth in I.A. through E. below. A student will be assigned in-state status for admission, tuition, and charge-differential purposes only if the student, or in the case of a financially dependent student, the student's parent, guardian, or spouse, fulfills all of the following.

A. For at least 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the petition applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must:

- own and continuously occupy or rent and continuously occupy living quarters in Maryland. There must exist a genuine deed or lease in the individual's name reflecting payments or rents and terms typical of those in the community at the time executed. People not having such a lease may submit an affidavit reflecting payments or rents and terms as well as the name and address of the person to whom payments are made which may be considered as meeting this condition. As an alternative to ownership or rental of living quarters in Maryland, a student may share living quarters in Maryland which are owned or rented and occupied by a parent, legal guardian, or spouse;

- maintain within Maryland substantially all personal property;
 - pay Maryland income taxes on all earned taxable income, including all taxable income earned outside the state;
 - receive no public assistance from a state other than Maryland or from a city, county, or municipal agency other than one in Maryland; and
 - have a legal ability under federal and Maryland law to reside permanently in Maryland without interruption.
- B. For at least 11 consecutive months immediately prior to and including the last date available to register for courses in the semester for which the application applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must:
- register all owned motor vehicles in Maryland, and
 - obtain a valid driver's license issued by the state of Maryland, if licensed to drive in any other jurisdiction.
- C. Within the 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the application applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must register to vote in Maryland, if registered in any other jurisdiction.
- D. A financially independent student classified as in-state loses that status at such time as the student no longer meets one or more of the criteria set forth in I.A. through C above. A financially dependent student classified as in-state loses that status at such time as the parent, guardian, or spouse on whom the status was based no longer meets one or more of those criteria.
- E. In addition, people in the following categories shall be accorded the benefits of in-state status for the period in which any of the following conditions apply:
- a full- or part-time (at least 50 percent) regular employee of the University System of Maryland
 - the spouse or dependent child of a full- or part-time (at least 50 percent) regular employee of the University System of Maryland
 - a full-time active member of the Armed Forces of the United States whose home of residence is Maryland or one who resides or is stationed in Maryland, or the spouse, or a financially-dependent child of such a person
 - for University of Maryland University College, a full-time active member of the Armed Forces of the United States on active duty, or the spouse of a member of the Armed Forces of the United States on active duty
 - a graduate assistant appointed through the University System of Maryland for the semester or session of the appointment. Except through prior arrangement, status is applicable only for enrollment at the institution awarding the assistantship
- F. Students not entitled to in-state status under the preceding paragraphs shall be assigned out-of-state status for admission, tuition, and charge-differential purposes.

II. Procedures

- A. An initial determination of in-state status will be made by the University at the time a student's application for admission is under consideration. The determination made at that time, and any determination made thereafter, shall prevail for each semester or session until the determination is successfully challenged in a timely manner.
- B. A change in residency status must be requested by submitting a University System of Maryland "Petition for Change in Residency Classification for Admission, Tuition and Charge Differential." A student applying for a change to in-state status must furnish all required documentation with the petition by the last published date to register for the forthcoming semester or session for which a residency classification is sought.
- C. The student shall notify the institution in writing within 15 days of any change of circumstances which may alter in-state status.
- D. In the event incomplete, false, or misleading information is presented, the institution may, at its discretion, revoke in-state status and take other disciplinary actions provided for by the institution's policy. If in-state status is gained due to false or misleading information, the University reserves the right to retroactively assess all out-of-state charges for each semester or session affected.
- E. Each institution of the University System of Maryland shall develop and publish additional procedures to implement this policy. Procedures shall provide that on request the president or designee has the authority to waive any residency criterion as set forth in section I, if it is determined that application of the criterion creates an unjust result. These procedures shall be filed with the Office of the Chancellor.

III. Definitions

- A. **Financially Dependent:** For purposes of this policy, a financially dependent student is one who is claimed as a dependent for tax purposes, or who receives more than one-half of his or her support from a parent, legal guardian, or spouse during the 12-month period immediately prior to the last published date for registration for the semester or session. If a student receives more than one-half of his or her support in the aggregate from a parent, legal guardian, or spouse, the student shall be considered financially dependent on the person providing the greater amount of support. The dependent relationship must have formally existed by legally contracted marriage or court order recognized under the laws of the state of Maryland for at least 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the petition applies.
- B. **Financially Independent:** A financially independent student is one who (a) declares himself or herself to be financially independent as defined herein, (b) does not appear as a dependent on the federal or state income tax return of any other person, (c) receives less than one-half of his or her

support from any other person or people, and (d) demonstrates that he or she provides through self-generated support one-half or more of his or her total expenses.

- C. Parent: A parent may be a natural parent, or if established by a court order recognized under the laws of the state of Maryland, an adoptive parent.
- D. Guardian: A guardian is a person so appointed by a court order recognized under the laws of the state of Maryland.
- E. Spouse: A spouse is a partner in a legally contracted marriage as recognized under the laws of the state of Maryland.
- F. Self-generated: Describes income which is derived solely from compensation for an individual's own efforts as evidenced, for example, by federal or state W-2 forms or IRS Form 1099, in which interest income is based upon finances created from one's own efforts. For the purposes of this policy, grants, stipends, awards, benefits, loans, and gifts (including federal and state aid, grants, and loans) may not be used as self-generated income.
- G. Regular Employee: A regular employee is a person employed by the University System of Maryland who is assigned to a state budget line. Examples of categories not considered regular employees are graduate assistants, contingent employees, if-and-when-needed, and temporaries.

Approved by the University System of Maryland Board of Regents, Aug. 28, 1990; amended Nov. 27, 2000.)

STUDENT RIGHT-TO-KNOW AND CAMPUS SECURITY ACT

The Student Right-to-Know and Campus Security Act (Public Law 101 542), signed into federal law Nov. 8, 1990, requires that the University of Maryland make readily available to its students and prospective students the information listed below. Should you wish to obtain any of the following information, send your name, address, school, and program, and a listing of the items of interest to:

Office of Student Services
Attention: Student Right-to-Know Request
University of Maryland
621 W. Lombard St., Room 302
Baltimore, MD 21201

- Financial Aid
- Costs of Attending the University of Maryland
- Refund Policy
- Facilities and Services for Students with Disabilities
- Procedures for Review of School and Campus Accreditation
- Completion and Graduation Rates for Undergraduate Students
- Loan Deferral Under the Peace Corps and Domestic Volunteer Services Act

- Campus Safety and Security
- Campus Crime Statistics
- Student Sexual Orientation Nondiscrimination

STUDENT SEXUAL ORIENTATION NONDISCRIMINATION

I. Background

Effective July 11, 1997, the University System of Maryland Board of Regents specifically prohibited discrimination against students on the basis of sexual orientation in academic admissions, financial aid, educational services, housing, student programs and activities, and recruitment. The board reserved the right to enforce or comply with any federal or state law, regulation or guideline, including conditions for the receipt of federal funding. This University reiterates its commitment to the most fundamental principles of academic freedom, equality of opportunity, and human dignity by requiring that treatment of its students and applicants for admission be based on individual abilities and qualifications and be free from invidious discrimination.

II. Related Employment Policy

University students who are also University employees should be aware of the "Employee Sexual Orientation Nondiscrimination Policy and Procedures."

III. Definition

Sexual orientation is the identification, perception, or status of an individual as to homosexuality, heterosexuality, or bisexuality.

IV. Policy

Consistent with USM's policy, it is this University's policy that:

- within the University, the educational environment will be free of discrimination on the basis of sexual orientation, and
- University students are prohibited from discriminating on the basis of sexual orientation against fellow students, University personnel, and other people with whom the students interact during the course of their educational experiences both on- and off-campus. Students may be disciplined for violation of this policy.

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Robert A. Jasinski, BSP, City Pharmacy of Elkton
Sandra A. Jaskulski, BSP, Rite Aid Pharmacy
Julie S. Johnson, BSP, NeighborCare Pharmacies, Inc.
Mitchell A. Johnston, PharmD, VA Medical Center
John T. Jordan, Jr., PharmD, Peninsula Regional Medical Center
Ramon Juta, BSP, Rite Aid Pharmacy
Timothy T. Kafauver, BSP, VA Medical Center
Christine Kahley, PharmD, York Hospital
Behnam Kamrad, PharmD, Kaiser Permanente
Tep M. Kang, PharmD, Christiana Care Health System
Bennett Kantorow, BSP, VA Medical Center
Robert Kantorski, BSP, Ritchie Pharmacy
Albert Katz, PharmD, Arundel Pharmacy
Ronald E. Kavanagh, PharmD, Food and Drug Administration
Laura Keefer, PharmD, University of Maryland Medical System
Charles W. Kelly, BSP, Craig's Drug Store, Inc.
Deanna L. Kelly, PharmD, Maryland Psychiatric Research Center
Ed Kern, BSP, Weis Pharmacy
Mark Kern, PharmD, Mercy Medical Center
Masoomeh Khamesian, PharmD, Howard County General Hospital
Brenda J. Kiliany, PharmD, Food and Drug Administration
Brian Y. Kim, BSP, CVS Pharmacy
Hannah Kim, PharmD, American Society of Health-System Pharmacists
Mari Kim, PharmD, Doctors' Community Hospital
Tina S. Kim, PharmD, Kaiser Permanente
David King, BSP, Georgetown Infusion Services
Larissa Kitenko, PharmD, Peninsula Regional Medical Center
Ronald P. Kleiman, BSP, Wal-Mart Pharmacy
Dennis Klein, BSP, Giant Pharmacy
Robert Kline, BSP, Atlantic General Hospital
David Knauer, BSP, Johns Hopkins Pharmaquip
Joan Korek, PharmD, Astra Pharmaceuticals
David A. Kotzin, MS, Walter Reed Army Medical Center
Tamara Kozlowski, PharmD, Carroll County Hospital
Mary E. Kremzner, PharmD, Food and Drug Administration

Jay Krosnick, BSP, NeighborCare Pharmacies, Inc.
Edmond J. Kucharski, BSP, Carroll County Hospital
John A. Kudrick, MS, McKesson Bioservices
Scott Kuperman, BSP, NeighborCare Pharmacies, Inc.
Vincent Lacroce, PharmD, Penn State Geisinger Health System
Lisa Lansberry, PharmD, Giant Pharmacy
Judy L. Lapinski, PharmD, CVS Pharmacy
Betsy T. Le, PharmD, VA Medical Center
Dan Le, PharmD, Franklin Square Hospital Center
Louise Leach, BSP, Northwest Hospital Center
Alice Lee, PharmD, Kaiser Permanente
Laura Lees, PharmD, The Johns Hopkins Hospital and Health System
Laura R. Lehman, PharmD, Union Memorial Hospital
DeAnna D. Leikach, BSP, NeighborCare Pharmacies, Inc.
Neil Leikach, BSP, Catonsville Pharmacy
Louis E. Levenson, MAS, Kernan Hospital
Mark A. Levi, BSP, Epic Pharmacies, Inc.
Bonnie Levin, PharmD, Laurel Regional Hospital
Dizza Levy, BSP, NeighborCare Pharmacies, Inc.
Joseph Libercci, BSP, Park Avenue Pharmacy
Mark Lichtman, BSP, Drug City Pharmacy
David Liebman, DPA, Kayes AID Pharmacy
Larry P. Lim, PharmD, Food and Drug Administration
Steven D. Lowery, PharmD, Pharmcare of Cumberland
Timothy Lubin, BSP, NeighborCare Pharmacies, Inc.
Mitchell D. Lucy, MS, Malcolm Grow Medical Center
Nancy B. Mable, BSP, U.S. Pharmacopeia
Alonzo Mable, MS, Kaiser Permanente
Marie Mackowick, PharmD, Crownsville Hospital Center
Alexandra L. MacLeod, BSP, CVS Pharmacy
Jeffery Maltese, BSP, Shoppers Pharmacy
Laura K. Mark, PharmD, The Johns Hopkins Hospital and Health System
Scott M. Mark, PharmD, Children's National Medical Center
Paul Marra, BSP, Giant Pharmacy
Julianna T. Marten, PharmD, Mt. Washington Pediatric Hospital
Brian R. Martin, PharmD, VA Medical Center
Robert Martin, Jr., BSP, Potomac Valley Pharmacy, Inc.
Todd E. Martino, PharmD, Giant Pharmacy
Robert Massey, MSA, Walter Reed Army Medical Center
Herbert G. Mathews III, PharmD, Mt. Washington Pediatric Hospital
Peter T. Mbi, BSP, The Medicine Shoppe
Robert J. McAuley, MS, Pfizer, Inc.
Mark McDougall, BSP, McDougall's Pharmacy
Helen McFarland, PharmD, The Johns Hopkins Hospital and Health System
Earle G. McFerren, BSP, Eckerd Pharmacy
Gina McKnight-Smith, PharmD, MBA, NeighborCare Pharmacies, Inc.

Michael F. McMahon, BSP, Rite Aid Pharmacy
Neo Melonas, BSP, VA Medical Center
Henry E. Merritt, PharmD, National Naval Medical Center
Nasir Mian, PharmD, Reston Hospital Center
Harvey Miller, BSP, Rite Aid Pharmacy
Katherine D. Mills, PharmD, Penn State Milton S. Hershey Medical Center
Martin Mintz, BSP, Northern Pharmacy & Medical Equipment
Rita Mitsch, PharmD, Franklin Square Hospital Center
Laurie Mohler, BSP, NeighborCare Pharmacies, Inc.
Joseph M. Morrissey, MS, Howard County General Hospital
Pam Moussavian-Yousefi, PharmD, Walter Reed Army Medical Center
Jeffrey L. Moyer, BSP, Waynesboro Hospital
Charles Muendlein, BSP, Lykos Pharmacy
Linda Nadal-Hermida, BSP, Kmart Pharmacy
Leon Nelson, BSP, Rite Aid Pharmacy
Matthew Nelson, PharmD, VA Medical Center
John Ness, PharmD, Fallston General Hospital
Pauline Newman, BSP, The Johns Hopkins Hospital and Health System
Teresa Ng, PharmD, Kaiser Permanente
Nicole T. Nguyen, BSP, Shoppers Pharmacy
Bao-Anh Nguyen-Khoa, PharmD, Center for Health Information, Inc.
Mary Ann Niesen, PharmD, Crownpoint Healthcare Facility
Akwasi Nkansah, BSP, Rite Aid Pharmacy
Ronald A. Nosek, Jr., MS, National Naval Medical Center
Joseph Nusbaum, BSP, Ambulatory Care Pharmacy
Godwin Odunze, MS, DC Chartered Health Center
Donna L. O'Keefe, PharmD, Washington County Hospital
Helen Osborn, BSP, Montgomery General Hospital
Richard Ottmar, MBA, Western Maryland Health System
Heather A. Owens, PharmD, Pharmaquip/Rx Express at Bayview
Larry Owens, PharmD, York Hospital
Victoria C. Paoletti, PharmD, Christiana Care Health System
Jane A. Paranych, PharmD, The Johns Hopkins Hospital and Health System
Joseph Pariser, BSP, Giant Pharmacy
Richard D. Parker, Jr., BSP, Giant Pharmacy
Daniel S. Pastorek, BSP, Shoppers Pharmacy
Ashish Patel, BSP, CVS Pharmacy
Kalpna Patel, MS, Giant Pharmacy
Mira M. Patel, BSP, The Medicine Shoppe
David W. Patterson, BSP, Health Guard
Robert Patti, PharmD, York Hospital
Carol Paulick, MBA, St. Agnes Health Care
James Pellenbarg, BSP, Wal-Mart Pharmacy
Maureen A. Pelosi, BSP, Food and Drug Administration
David Perrott, BSP, Mt. Washington Pediatric Hospital
Janice V. Perry, PharmD, VA Medical Center

Lynn J. Peterson, BSP, CVS Pharmacy
Wallace Pickworth, PhD, NIDA, Addiction Research Center
Mark Pilachowski, BSP, Klein's Pharmacy
Sanyi Pin, BSP, Bon Secours Hospital
Bonnie L. Pitt, MAS, Frederick Memorial Hospital
Marilyn R. Pitts, PharmD, Greater Southeast Community Hospital
Barry Poole, BSP, Food and Drug Administration
David Posner, BSP, Giant Pharmacy
Patricia A.G. Powers, PharmD, Kaiser Permanente
Cathy A. Prenger, PharmD, CVS Pharmacy
Douglas Pryor, MBA, Maryland General Hospital
Frank Pucino, Jr., PharmD, National Institutes of Health
Jacob Raitt, PhD, Rite Aid Pharmacy
Ashok A. Ramkissoon, BSP, HomeCall Pharmaceutical Services, Inc.
Blanca Ratzlaff, PharmD, VA Medical Center
Diane T. Raum, BSP, Safeway Pharmacy
Robert F. Reinke, BSP, Greater Baltimore Medical Center
Jeffery A. Reitz, PharmD, Christiana Care Health System
Earl W. Rhoads, BSP, The Medicine Shoppe
Carol Ritchie, BSP, Thomas B. Finan Center
Kim Z. Robbins, BSP, Happy Harry's Pharmacy
Michael D. Roberts, MS, National Rehabilitation Hospital
David Rochlin, BSP, Giant Pharmacy
Jeffrey Rodkey, BSP, Rite Aid Pharmacy
Amilcar Rodriguez, MS, National Naval Medical Center
Luis F. Rosado, BSP, Target Pharmacy
Dennis Rosenbloom, PharmD, Rexall Pharmacy
Wendy M. Rosenthal, PharmD, MedOutcomes, Inc.
Annette M. Rowden, PharmD, The Johns Hopkins Hospital and Health System
Carol Rudo, PharmD, VA Medical Center
David Russo, MBA, Russo's Pharmacy
James J. Rybacki, PharmD, The Clearwater Group
Cyrus Samet, PharmD, Suburban Hospital
Margaret A. Sanbower, BSP, Weis Pharmacy
Brian T. Sanderoff, BSP, Your Prescription for Health
Mark R. Sanford, MBA, University of Maryland Medical System
Joseph J. Scalese III, BSP, Weis Pharmacy
Randolph Schaap, BSP, Rite Aid Pharmacy
Edward Schairer, BSP, Weis Pharmacy
Howard R. Schiff, BSP, Maryland Pharmacists Association
Angelica Schneider, BSP, NeighborCare Pharmacies, Inc.
Kevin A. Schnupp, PharmD, Maryland General Hospital
Joseph Schuman, BSP, Maryland Rehabilitation Center Pharmacy
Brian Schumer, BSP, Rite Aid Pharmacy
Rizwan A. Shah, MS, Weis Pharmacy
Kelly Shanahan, BSP, Kmart Pharmacy

Brent Sharf, BSP, Bon Secours Hospital
Matthew G. Shimoda, PharmD, NeighborCare Pharmacies, Inc.
Chong W. Shin, BSP, University of Maryland Medical System
Scott A. Shoop, PharmD, Christiana Care Health System
Lawrence Siegel, MAS, Carroll County Hospital
Cheryl Simmons-Gray, PharmD, Kaiser Permanente
Robert Sinker, BSP, Potomac Village Pharmacy
Melissa Skarbelis, BSP, Wal-Mart Pharmacy
Jann B. Skelton, MBA, Medica
Ralph A. Small, Jr., BSP, Rite Aid Pharmacy
Billy R. Smith, MA, Monarch Pharmaceuticals, Inc.
Donald Smith, PharmD, USPHS YK Delta Regional Hospital
John Smith, BSP, Giant Pharmacy
Gary Sobotka, BSP, CVS Pharmacy
Dominic A. Solimando, Jr., MA, Walter Reed Army Medical Center
Suzanne L. Spurr, PharmD, Wal-Mart Pharmacy
James R. Staffa, BSP, Shoppers Pharmacy
Leila V. Stecklein, PharmD, Kaiser Kensington Pharmacy
Carol Stevenson, BSP, Metro Pharmacy
Jerry C. Stewart, BSP, Western Maryland Health System
Howard C. Stoops, BSP, Syncor Pharmacy Services
Gary R. Stout, BSP, Safeway Pharmacy
Susan Sullivan, BSP, Target Pharmacy
Susan L. Summers, BSP, CVS Pharmacy
Suzanne Suter-Lowe, BSP, Rite Aid Pharmacy
William Tabak, BSP, Rite Aid Pharmacy
Richard Tarr, BSP, Giant Pharmacy
Lawrence Taylor, BSP, CVS Pharmacy
Eloise Thibault, PharmD, American Pharmaceutical Association
Christopher E. Thomas, PharmD, VA Medical Center
Keith R. Thomasset, PharmD, The Johns Hopkins Hospital
Karen Thompson, BSP, St. John's Pharmacy
Donna L. Topping, PharmD, The Johns Hopkins Hospital
Lisa Townsend, PharmD, Hill's Drug Store
Dat T. Tran, BSP, CVS Pharmacy
Hieu T. Tran, PharmD, Kent General Hospital
Penelope Trikeriotis, BSP, Giant Pharmacy
Kathleen Truelove, BSP, The Johns Hopkins Hospital
Marshall Tsakiris, BSP, Giant Pharmacy
Richard Tsao, PharmD, Greater Southeast Community Hospital
Sara C. Turk, PharmD, Good Samaritan Hospital
Nancy D. Tzeng, PharmD, Johns Hopkins Bayview
Tracy M. Valani, PharmD, Penn State Milton S. Hershey Medical Center
Beth Vanderheyden, PharmD, University of Maryland Medical System
Wayne VanWie, BSP, Safeway Pharmacy
David J. Vaxmonsky, BSP, Happy Harry's Pharmacy

Michael A. Veltri, PharmD, Johns Hopkins Children's Hospital
Rebecca A. Viola, BSP, Walter Reed Army Medical Center
Paul Vitale, PharmD, Anne Arundel Medical Center
Doris Voigt, BSP, Kimbrough Ambulatory Care Center
J. Kenneth Walters, PharmD, Sheppard Pratt Hospital
Terrill Washington, PharmD, VA Medical Center
D. Raymond Weber, PharmD, Kent and Queen Anne's Hospital
Marc R. Weinberg, BSP, Super Fresh Pharmacy
Michael Weinstein, BSP, The Apothecary
Sandra S. Werking, PharmD, Mercy Medical Center
Stephen W. Wickizer, PharmD, AHCPR
Thomas Wieland, BSP, Safeway Pharmacy
Stephen Wienner, BSP, Mt. Vernon Pharmacy
Anne M. Wiland, PharmD, University of Maryland Medical System
Donna C. Williams, BSP, Alpharma
Thomas Williams, PharmD, Wellspan Pharmacy
Rene L. Williamson, PharmD, Kaiser Permanente
Sharon D. Wilson, PharmD, University of Maryland Medical System
Thomas Wilson, PharmD, Cape Apothecary
Dante R. Winter, BSP, CVS Pharmacy
Rudy Winternitz, BSP, Brookville Pharmacy
Eileen Wu, PharmD, Montgomery General Hospital
Beverly Yachmetz, PharmD, Diabetes Connection
Ellen Yankellow, PharmD, Y&S Pharmacy Services, Inc.
Martin Yankellow, BSP, Weis Pharmacy
David M. Yoder, PharmD, HomeCall Pharmaceutical Services, Inc.
Eric J. Yospa, BSP, Family Pharmacy of Hampstead
Deirdre A. Younger, BSP, Health Center Pharmacy
Jonas J. Yousem, BSP, NeighborCare Pharmacies, Inc.
Catherine C. Yu, PharmD, Food and Drug Administration
Faramarz Zarfeshanfard, BSP, The Johns Hopkins Hospital and Health System
C. Alex Zarow, MBA, Kent General Hospital
Robert Zepp, BSP, University of Maryland Medical System

Clinical Instructor

William R. Chester, PharmD, Safeway Pharmacy
Seth A. Cohen, PharmD, CVS Pharmacy
Chi Duong, PharmD, Santa Fe Indian Hospital
William Ehrlich, PharmD, Johns Hopkins Bayview
Robin Garner-Smith, PharmD, Care Apothecary

Program Course Descriptions

PHARMD COURSE DESCRIPTIONS

DIDACTIC REQUIRED COURSES

PHAR 510—Biochemistry (3)

A course of study which builds on the principles of cell biology and genetics with a systematic consideration of the chemical components and requirements of living systems from the molecular to the cellular level. These fundamentals of biochemical structure, function, and energetics provide a platform for comprehension of pharmaceutical biotechnology, and for understanding determinants of disease, the pathobiochemistry of organ systems, mechanisms of drug action and adverse reactions, and novel drug delivery systems.

PHAR 513—Drug Chemistry (2)

A study of the principles of organic chemistry that comprise basic elements of pharmaceutical science. The emphasis is on the relationship between molecular structure and chemical, physical, and biophysical properties of systems that arise from molecular interactions. The course provides a platform for comprehension of pharmaceutical concerns such as the stability of drugs and drug products, the conformation of bioactive proteins, the basis for drug-receptor interactions, the structure of biological membranes, and major drug classes.

PHAR 514—Human Biology I (3)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology, and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.

PHAR 516—Pharmacy Practice and Education (2)

This prefatory course introduces the new Doctor of Pharmacy student to the science and profession of pharmacy. The evolution and implications of pharmaceutical care and the philosophical basis for the pharmacy curriculum are discussed. Students are introduced to skills necessary for success during the four-year curriculum through the opportunity to critically evaluate problems, discuss

ethical dilemmas, develop and apply computer and literature-retrieval skills, and practice verbal and written communication skills. The importance of independent and cooperative learning activities is emphasized.

PHAR 517—Study Design and Analysis (2)

Students are introduced to the pivotal role of study design and statistical analysis considerations in the design and evaluation of basic, clinical, epidemiological, and social science research. The course focuses on the proper design of studies with emphasis on threats to internal validity and generalizability. A variety of descriptive and inferential statistical procedures and methods are surveyed with emphasis on the interpretation of the results of research.

PHAR 520—Molecular Biology (3)

This course is an integrated Cell and Molecular Biology course. It is designed to thoroughly introduce the student to the mechanisms of DNA replication, recombination, repair, transcription, protein synthesis, and gene regulation and signal transduction. The course focuses on the relationship of these processes to current pharmaceutical interventions and those of the future. At the conclusion of this course, the student will also be able to describe, in detail, the mechanisms of DNA metabolism, protein synthesis, gene regulation, and signal transduction. The student will also be able to describe and indicate the basis for current diagnostic tests that incorporate modern Cell and Molecular Biology techniques.

PHAR 522—Context of Health Care (3)

Students actively develop a contemporary definition of health care and critically examine the health care system with special emphasis on relevant legislation, traditional and nontraditional providers of health care, the organization and financing of health care delivery, and the dynamics of pharmaceutical care within the system. The social, legal, and professional implications of informatics and computer proliferation in our society is discussed with special emphasis on pharmacy practice.

PHAR 523—Ethics in Pharmacy Practice (1)

Introduction to the principles of ethical thinking. The philosophy of ethics and role of formal codes of professional conduct are discussed in the context of resolving conflicting ethical principals.

PHAR 524—Human Biology II (3)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology, and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.

PHAR 525—Immunology (2)

The natural and acquired protective mechanisms of the immune system are discussed with topics ranging from the structure, function, and specificity of antibodies; B-lymphocyte and T-lymphocyte functions; initiation and control of immune responses; histocompatibility; and immune-mediated disease. The course is designed to provide the student with sufficient knowledge of humoral and cellular immunity to understand the role of the immune system in disease, the production and use of vaccines and related biologicals, and the rapidly growing areas of transfusion, transplant, and tumor immunology.

PHAR 526—Physical Chemistry (2)

A study of selected principles of physical chemistry that comprise basic elements of pharmaceutical science. The emphasis is placed on the relationship between molecular structure and the physical and biophysical properties of systems that arise from molecular interactions. The goal of the course is to apply the principles of physical chemistry to the practice of pharmacy.

PHAR 530—Microbiology/Antibiotics I (2)

A study of the major classes of pathogenic bacteria, bacterial infectious diseases and antibacterial agents. This course surveys pertinent features of bacterial structure and virulence factors, host response and disease manifestations and antibacterial drug design, mechanisms, pharmacokinetics, and toxicity profile. This course will provide the framework for consideration of the therapeutic principles involved in treating bacterial diseases.

PHAR 531—Pharmaceutical Chemistry (2)

A presentation of the basic chemical principles underlying the activity, absorption, metabolism, excretion, physico-chemical properties, and design of drug molecules, culminating in a discussion of drug classes.

PHAR 533—Medicinal Chemistry I (1)

A comprehensive study of the chemistry of drug products. The course outline will follow the pharmacological classification of drug molecules, and will include discussion of chemical properties (physical and organic), stability, solubility, mechanisms of action where appropriate, and structure-activity relationships. Where possible, quantitative computer designed studies of drug development will be mentioned.

PHAR 534—Human Biology III (3)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology, and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.

PHAR 535—Pharmaceutics (3)

The application of fundamental principles and basic science knowledge to the multidimensional problems of the formulation, development, testing, production, distribution, and administration of safe, effective, stable, and reliable drug delivery systems. These systems, ranging in sophistication from tablets and capsules to biodegradable implants, are discussed using a problem-based approach that focuses on the critical determinants for traditional and less-traditional routes of drug administration.

PHAR 536—Pharmacology I (3)

A systematic consideration of the molecular, cellular, and organismic mechanisms of drug action, organized by major drug classes. This course of study provides knowledge of the mechanisms of drug action underlying their use in the treatment of specific and general disease processes.

PHAR 537—Principles of Drug Action (2)

A study of the chemical and biological concepts which apply to the characterization, evaluation, and comparison of all drugs. Topics such as dose-response and receptor theory, receptor transduction mechanisms, pharmacologic selectivity, pharmacogenetic drug tolerance and dependence, drug allergy, drug resistance and chemical mutagenesis, carcinogenesis, and teratogenesis are discussed at the molecular and cellular level. The physical, biological, and chemical principles underlying drug absorption, distribution, biotransformation, and excretion are discussed from the molecular to the organ level.

PHAR 540—Microbiology/Antibiotics II (2)

A study of the major classes of pathogenic fungi and viruses, the diseases that they cause and antifungal and antiviral agents. This course surveys pertinent features of fungal and viral structure, virulence factors, life-cycle, disease manifestations and antifungal/antiviral drug design, mechanisms, pharmacokinetics, and toxicity profile. This course will provide the framework for consideration of the therapeutic principles involved in treating fungal and viral diseases.

PHAR 541—Biopharmaceutics and Pharmacokinetics (3)

In this course, the student learns how the processes of drug absorption, distribution, metabolism, and excretion are coupled with dosage and the important parameters of clearance, volume of distribution, and bioavailability, to determine the concentration of a drug at its sites of action in the body. The quantitative relationship between dose and effect is developed as a framework with which to interpret measurements of drug concentrations in biological fluids.

PHAR 542—Clinical Chemistry (1)

Principles of analytical chemistry, clinical chemistry, enzyme assays, electrophoresis, radioactivity, magnetic resonance, biotechnology-based diagnostics and biosensors, and immunoassay are examined. Emphasis is on the application of these methods to the determination of drug concentrations in chemical and bio-

logical systems, and health promotion and assessment. Students also have opportunities to examine patient data and use commercially available diagnostic kits.

PHAR 543—Medicinal Chemistry II (2)

A comprehensive study of the chemistry of drug products. The course outline will follow the pharmacological classification of drug molecules, and will include discussion of chemical properties (physical and organic), stability, solubility, mechanisms of action where appropriate, and structure-activity relationships. Where possible, quantitative computer designed studies of drug development will be mentioned.

PHAR 545—Practice Management (3)

Management principles are provided to construct a practical framework for the operational management of a business of pharmacy. Elements addressed in this course include controllable and uncontrollable variables in a free-market economy; work flow analysis; accounting and budget development; purchasing and inventory control; quality assurance; and third-party reimbursement issues. The course also examines the current practical developments related to human resources management through integrating information on organization behavior, psychology, economics, and law.

PHAR 546—Pharmacology II (3)

A systematic consideration of the molecular, cellular, and organismic mechanisms of drug action, organized by major drug classes. This course of study provides knowledge of the mechanisms of drug action underlying their use in the treatment of specific and general disease processes.

PHAR 552—Principles of Human Nutrition (1)

This required course builds on materials in earlier coursework including Fundamentals, Basic Science, and Pharmaceutical Science. The course focuses on the preparation of pharmacists to deliver pharmaceutical care services related to patients' nutritional needs. The course prepares the student to understand principles of nutrition in relation to contemporary public health issues and to treatment of diseases and physiologic processes. The materials taught in this course are applied and further developed in subsequent modules in the Integrated Science and Therapeutics course sequence and in Longitudinal Pharmaceutical Care II.

PHAR 553—Population Based Medical Information Analysis (2)

This course is designed to enhance a student's skills in the areas of information collection, retrieval, analysis, and interpretation. A variety of topics surrounding the aspects of drug information practice will be presented, including the role of informational services in health care. Students will enhance both their written and verbal communication skills as they not only are asked to retrieve pertinent clinical information, but also then to interpret, document, and integrate this information into the development of clinical practice guidelines and subsequent outcome measures.

PHAR 554—Integrated Science and Therapeutics I (4)**PHAR 555—Integrated Science and Therapeutics II (4)****PHAR 564—Integrated Science and Therapeutics III (4)****PHAR 565—Integrated Science and Therapeutics IV (4)**

Basic and clinical science faculty interact with students during a variety of didactic and laboratory experiences as students learn to design, implement, and monitor pharmaceutical care plans for specific patients with specific diseases. Methods for the choice of drug product, definition of the specific goals of therapy, including the means to assess whether these goals are being achieved, and active intervention steps at the patient, prescriber, health care system, and population levels to ensure successful outcomes of drug therapy are developed. The courses are organized according to the major physiological systems of the human body, and the disease states commonly associated with them and encountered and observed by the pharmacy practitioner in a variety of community and institutional practice settings. A goal of these courses is to prepare students to be able to better integrate new scientific knowledge into the successful pharmaceutical care of patients with the goal of reducing the health care costs to patients and society. The knowledge and behaviors acquired during these courses prepare the student for the community and institutional pharmaceutical care rotations of the experiential learning program of the curriculum.

PHAR 580—Pharmacy Law (2)

An examination of the legal and regulatory issues pertaining to drugs and devices and the practice of pharmacy. Students learn the various laws and regulations which would govern their usual daily activities in a variety of practice sites.

PHAR 581—Senior Colloquium (1)

Students deliver oral presentations to share some aspect of their educational experience, practice aspirations, or career goals with their student peers and the faculty. This forum fosters a critical examination of each student's formal education in the context of the practice of pharmaceutical care.

EXPERIENTIAL LEARNING REQUIRED COURSES

PHPC 510—Introduction to Professional Practice I (1)**PHPC 520—Introduction to Professional Practice II (1)**

Students observe the practice of pharmacy in community, institutional, and specialty practice environments. They analyze the types of services provided in each setting and the personnel involved in the delivery of those services. Students experience the basic elements of safe medication order processing and pharmaceutical care. An important goal of the course is for students to identify and assess career options in pharmacy practice. Activities include laboratory exercises, a career pathway workshop, and Web-based assignments.

PHPC 532—Longitudinal Pharmaceutical Care I (1)

Students observe the delivery of pharmaceutical care to patients over time. Particular attention is paid to assessing the changing needs of patients as health transitions occur. Under the supervision of an experienced pharmacy practitioner, students have regularly scheduled encounters with patients. Students learn how to effectively collect information from a variety of sources, including the patient, and prepare periodic health status reports. As students obtain knowledge and skills in didactic courses (pharmaceutics, pharmacology, human biology), they learn to explicitly apply such knowledge and skills to their patients. (Register Spring Semester, Second Year)

PHPC 562—Longitudinal Pharmaceutical Care II (1)

This course is a continuation of PHAR 532—Longitudinal Pharmaceutical Care I. Students have periodic encounters with previously assigned patients. Students learn to assess drug therapy problems and develop pharmaceutical care plans. Particular attention is given to the needs of patients during health transitions. These experiential activities are closely linked throughout the third year to the didactic activities in the Integrated Science and Therapeutics series of courses. (Register Spring Semester, Third Year)

PHPC 570—Safe Medication Order Processing in Community Pharmacy (3)**PHPC 571—Safe Medication Order Processing in Institutional Pharmacy (3)**

Students may take these courses after successfully completing the second year. PHPC 570 (Community) and PHPC 571 (Institutional) are required, three-credit professional practice experiences which target the inter-related elements of safe medication order processing, drug distribution, patient interaction, supervision of pharmacy technicians, use of technology, and practice administration/personnel management. In both the community and institutional setting, under the supervision of clinical faculty, students will be challenged to develop skill, competence, and efficiency in processing medication orders for distribution to and safe use by patients. (Register Fall Semester, Fourth Year)

PHPC 572—Pharmaceutical Care I (3)**PHPC 573—Pharmaceutical Care II (3)****PHPC 574—Pharmaceutical Care III (3)****PHPC 575—Pharmaceutical Care IV (3)**

This series of required professional practice experiences is designed to provide the student with extensive experience in pharmaceutical care delivery in a variety of direct patient care settings. Students gain skill through daily one-on-one interactions with patients, caregivers, physicians, nurses, and other health care professionals. There are four month-long, full-time required rotations. At least one rotation must be completed in an acute-care hospital setting and one in a community setting. Although each site will differ in terms of the patient population, disease acuity, scope of practice, resources, and availability of

patient-specific data, students will take responsibility for drug therapy outcomes. Students will learn to: 1) collect and record patient-specific data; 2) identify, list, and assess drug-related problems; 3) develop and record pharmaceutical care plans; 4) educate patients and health care professionals regarding the appropriate use of drugs; and 5) measure and document patient outcomes. These activities are closely linked to PHPC 576—Ambulatory Clinic and concurrent with PHPC 577—Informational Services. Prerequisites: PHPC 571 and successful completion of the Integrated Science and Therapeutics course series

PHPC 576—Ambulatory Clinic (1)

This series of required experiences is normally taken concurrently with the Pharmaceutical Care rotations (PHPC 572, 573, 574, and 575). A total of 16 half-day experiences is required, for a total of 64 hours. Following the pharmaceutical care model, students will conduct patient interviews, perform appropriate pharmacotherapy-oriented physical assessments, order appropriate laboratory tests, initiate and/or change drug therapy regimens and conduct patient follow-up. (Register Spring Semester, Fourth Year) Prerequisites: PHPC 571 and successful completion of the Integrated Science and Therapeutics course series.

PHPC 577—Informational Services (2)

This course must be taken concurrently with the Pharmaceutical Care rotations (PHPC 572, 573, 574, and 575). During the course of daily activities on Pharmaceutical Care and Ambulatory Clinic rotations, students learn how to receive drug information questions in a comprehensive manner, conduct timely and thorough literature searches, evaluate sources of information, and provide appropriate responses. Students are also expected to subscribe to an affordable abstracting service and develop a personal information library. (Register Spring Semester, Fourth Year) Prerequisite: Successful completion of PHAR 553.

DIDACTIC ELECTIVE COURSES

The elective didactic (PHMY) courses currently offered by the School of Pharmacy are described below. In general, higher course numbers indicate courses with important prerequisite requirements, and are designed for later years of the curriculum. Prerequisites for most electives include consent of the instructor and the student's advisor. Some electives are offered in either the fall or spring semesters, and some are offered both semesters. Refer to the class schedule when making course selections.

PHMY 510—Advanced Educational Opportunities (1)

This elective program provides students interested in graduate school or research careers with knowledge and information about various advanced educational opportunities in the curriculum. Aspects of careers which require advanced study are described by professionals in those career areas and by students currently

enrolled in them. The course offers diverse perspectives on goals, training, functions, settings, and opportunities in research in pharmaceutical sciences and pharmacy practice.

PHMY 511—Diabetes Disease State Management (1)

This course will review the pathophysiologic changes associated with diabetes mellitus (Types I and II, impaired glucose tolerance, and gestational diabetes), nonpharmacologic management (nutrition and exercise), pharmacologic management, complications of diabetes mellitus, principles of education (children, adolescents, adults, and geriatrics), continuous care (skin and foot care, OTC product selection), blood and urine monitoring, special population considerations (children, adolescents, geriatrics, visually impaired patients), psychosocial aspects of diabetes (dealing with diagnosis, developing support strategies, and adherence to regimens), and how to set up a diabetes-focused practice. Prerequisite: Fourth-year status.

PHMY 512—Case Based Management of Infectious Diseases I (1)

PHMY 513—Case Based Management of Infectious Diseases II (1, 2)

These courses provide third- and fourth-year students and students in the Non-traditional Pathway with an opportunity to critically examine the clinical decisions made in the management of patients with infectious diseases. During the first course, students will review the therapeutic decisions made in the care of a patient encountered during an experiential course and review the literature relevant to those decisions. During the second course, students will present a case discussion, including a thorough review of the standard of care and the literature support for the decisions made. Prerequisites: Third-year status or PHNT 545 and 546.

PHMY 514—Teaching Preparation and Skills (1)

The course is a basic introduction to instructional activities in general and teaching at the University of Maryland School of Pharmacy in particular. The first two days consist of a series of presentations on teaching-related topics. The instructors will develop a short interactive lecture on diabetes management to demonstrate each aspect of the teaching and presentation development process. There will be frequent in-class activities requiring student interaction. During these, students will begin to develop their own topic for presentation on the last day of class. Teaching Preparation and Skills is an unusual modular course originally developed for nontraditional PharmD students. It was intended to improve their ability to make in-class presentations. However, since the ability to create and deliver a lecture or seminar is fundamental to many students and faculty members within the School, it is now frequently attended by graduate students and new faculty members. In addition to teaching participants how to make presentations in general, it focuses on using presentation technology available in the School of Pharmacy.

PHMY 515—Contraception: Principles and Practice (1)

Instruction in this course focuses on the development of skills related to interviewing, evaluating, and counseling patients regarding contraception. At the completion of this course, the student should be able to state the advantages and disadvantages of the commercially available contraceptive options, effectively counsel patients on the use of contraceptive products, and determine the most appropriate contraceptive method(s) for a specific patient. Students are encouraged to practice newly acquired skills during patient encounters on experiential rotations. Prerequisites: Completion of Human Biology III (PHAR 534), Pharmacology I (PHAR 536), Principles of Drug Action (PHAR 537), and Longitudinal Care I (PHPC 532) or permission of coursemaster.

PHMY 516—Geriatric Imperative (2)

The Geriatric Imperative Minimester is a five-day interdisciplinary course open to all University of Maryland students during the first week in January. The course presents a wide range of information on the health and well-being of older adults through clinical, research, and policy presentations. Course content will be conveyed through lectures, panel discussions, team and case presentations, role play, video tapes, and site visits. Students will be required to write an in-depth paper on a subject pertaining to geriatrics/gerontology within two months of completing the didactic portion of the course.

PHMY 517—Geriatric Pharmacotherapy (2)

This course provides advanced discussion of the geriatric diseases and different presentations of disease and responses to therapy. A case-based approach expands on previous geriatric coursework and allows students to apply material to different patient-care settings. Journal club and drug information questions are utilized to illustrate concepts. Prerequisite: Third-year status.

PHMY 518—Drug Abuse Education (1-3)

Practice and training in the dissemination of drug information, especially drug abuse information to the public, are linked to the activities of the Student Committee on Drug Abuse Education (SCODAE). Students complete a 10-hour training session, observe community education programs presented by SCODAE, present several programs, and prepare a written report on a timely topic in the area of chemical dependence.

PHMY 520—Organizational Behavior (3)

The study of the effects of human behavior on organizational effectiveness. Attention is given to quality, team work, attitude toward work, satisfaction and commitment, building and exercising organizational power, the role of leadership, sustaining motivation, participatory decision-making, and the process for change, development, and continuous improvement.

PHMY 521—Financial Reporting (3)

This course is a study of financial reporting, analysis and strategy principles applied to for-profit and not-for-profit health care organizations. Accounting issues related to strategic decision-making in health service production, financing, and investment will be emphasized throughout the course. Topics include the health care accounting environment, revenue and expense recognition, balance sheet valuations, ratio analysis, budgeting and control systems, cost accounting, performance measurement, variance analysis, cost-volume-profit relationships, and capital budgeting. Special attention is given to the financial implications of third-party payment systems and measuring the profitability of managed-care contracts.

PHMY 522—Business Plan Development (2)

An elective course for students interested in ownership or management of their own pharmacy practice, emphasizing the practical problems associated with establishing a new business or expanding an existing enterprise. Location and market analysis, target marketing, revenue and expense projections, and estimation of capital requirements are among the topics covered.

PHMY 523—Advanced First Aid (3)

Advanced first aid and emergency care, including CPR.

PHMY 524—Marketing (3)

Marketing introduces methodologies for identifying changes in the organization's marketplace and adapting to them. The course uses the market-orientation concept, emphasizing customer needs, total integration of the firm, and the profit potential to examine the marketing process, and in doing so, will use pharmacy-based examples. Prerequisite: PHAR 545—Practice Management.

PHMY 525—Comprehensive Pediatric Care (2)

Comprehensive pediatric care is a two-credit course offered in the spring semester for third- and fourth-year students in the entry-level Doctor of Pharmacy Program. This elective course is designed to prepare students to optimize medicine use in pediatric patients in the ambulatory or institutional setting. The course will cover cognitive and physiological development, psychosocial factors affecting medicine use, pharmacist role, regulatory issues, and pediatric pharmacotherapy for various disease states.

PHMY 528—Selected Topics in Geriatrics and Gerontology (1-3)

This course provides an educational experience through investigating geriatrics and gerontology at the School's Center for the Study of Pharmacy and Therapeutics for the Elderly. Through an elder-visitation experience, students select an elderly person living in the community and track the individual's pharmaceutical care needs. Students also participate in guided discussions addressing elder health care problems and solutions.

PHMY 529—Special Group Studies (1-5)

(Repeatable up to 12 credits) An omnibus course permitting experimentation with new or different subject matter and/or instructional approaches.

PHMY 537—Clinical Aspects of Drug Dependence (2)

This course familiarizes students with the clinical aspects of chemical dependence. Special emphasis is placed on the pharmacology of commonly abused psychoactive substances and the role of pharmacological supports in the treatment of addiction.

PHMY 539—Special Projects (1-3)

(Repeatable up to 12 credits) Independent investigations consisting of library or laboratory research, seminars, or other assignments appropriate to the problem investigated.

PHMY 541—Introduction to the Poison Center (1)

This course provides students the opportunity to observe and be involved in a clinically oriented pharmacy practice setting early in their education. Students learn about the Poison Center's operation and resources and the potential for pharmacist participation in this area of patient care. The course consists of discussion sessions, activities in the Maryland Poison Center, role playing, and laboratory sessions focusing on toxicology resources and communication skills. Students present cases on a home-management and a hospital-management drug overdose.

PHMY 543—Honors Seminar in Pharmacy Administration (1)

A survey of current literature in the general area of pharmacy practice and administrative science. Each week, a recently published paper related to the economic, social, behavioral, or educational aspects of pharmacy is discussed and evaluated. Special student research projects may also be undertaken.

PHMY 550—Adverse Drug Reactions (2)

Focus is on the clinical manifestations and incidence of drug reactions, systems affected, differentiation among idiosyncratic reactions, hypersensitivity reactions, extensions of pharmacologic action, and assessment of drug reaction literature.

PHMY 551—Recent Advances in Pharmacology (1)

The objective of this course is to present advances in pharmacology and toxicology. Sessions emphasize experimental and clinical findings and their interpretation and significance in relation to basic and applied aspects of pharmacology and toxicology. Attention is also given to experimental design and methodology of the studies in question.

PHMY 552—Pharmacology and Aging (1)

This course presents advances in our understanding of variations in drug response in the aging population. The course is designed to give students an

appreciation for the basic physiological and biomedical changes which normally occur with aging and how these changes relate to altered pharmacodynamic and pharmacokinetic responses following drug administration. Basic and clinical pharmacologic studies are used to support the conclusions presented.

PHMY 553—Consumer Education Program for Older Adults (2)

This course trains students to educate the elderly about drugs and drug-taking. Students benefit from the didactic and applied aspects of the course, since they must first learn about the special needs of the elderly and then actually interact with the elderly both in large groups and one-on-one.

PHMY 554—Health Education Seminar (2)

The course prepares students to become effective health educators to patients, other health care practitioners, and/or the community. The theoretical and conceptual bases of the health education discipline are fully developed. Students learn the techniques of behavioral and educational diagnosis and their application to the development of educational intervention.

PHMY 556—Advanced Pharmacology I (2)

PHMY 557—Advanced Pharmacology II (2)

This course expands and extends the pharmacology material learned in the required courses PHAR 536 and 546. The course format is the discussion of assigned topics and review of original papers in a two-hour, weekly session. These sessions include graduate students in the pharmaceutical sciences.

PHMY 560—The Pharmacist in the Critical Care Setting (1)

This course identifies and explores the role of the pharmacist in various critical-care settings. The student will be able to see how critical-care pharmacy has evolved to complement the medical and nursing management of the critically ill patient.

PHMY 561—Advanced Therapeutics Seminar (3)

An advanced course dealing with complex drug therapy decision-making, using case presentations and current literature. Requires active student participation in resolution of therapeutic controversies.

PHMY 562—Clinical Pharmacokinetics (2)

The course will extend the student's knowledge of clinical pharmacokinetics, develop the student's skills in providing pharmacokinetic drug monitoring during PharmD rotations, and prepare students for post-graduate work in clinical pharmacology research. Emphasis is placed on the application of these principles to clinical practice and clinical research.

PHMY 563—Pharmacotherapeutic Issues in the Critically Ill Patient (2)

This course is an elective seminar for students interested in critical care pharmacotherapy. Topics include a broad scope of disease states and drug issues frequently encountered in an ICU setting. Presentations will identify the pharmacologic aims and controversies in the management of a particular topic, while simultaneously underscoring the complexities of drug therapy in the critically ill patient, which may lead to untoward reactions or suboptimal care.

PHMY 567—Advanced Cardiac Life Support (2)

This course focuses on the role of the pharmacist in the setting of cardiac arrest. A lecture format covers the pathophysiology, epidemiology, therapeutic goals, and treatment modalities in cardiac arrest as described by the Standards and Guidelines developed by the National Conference on Cardiopulmonary Resuscitation and Emergency Cardiac Care. Topics include the role of the pharmacist on the cardiac arrest team, an in-depth discussion of the role of pharmacologic intervention, techniques of basic and advanced cardiac life support, and post-resuscitative care.

PHMY 574—Pharmacotherapeutics I (2)

PHMY 575—Pharmacotherapeutics II (2)

Pharmacotherapeutics is a course in advanced therapeutic decision-making which parallels the therapeutic topics offered in the Integrated Science and Therapeutics modules during the third year of the curriculum. The course requires students to formulate therapeutic decisions based upon case materials and emphasize the process of decision-making in the presence of multiple patient and agent variables. As the number of cumulative therapeutic topics increases, the complexity of the decision-making increases. Students are expected to incorporate data from the primary literature as part of the therapeutic decision-making process.

PHMY 576—Advanced Topics in Pharmaceutics (2)

This course will allow students to become familiar with advanced topics in pharmaceutics. Different topics will be presented in the form of lectures, group discussions of original papers, and laboratories and will include bile acid sequestrants, drug dissolution, production methods for inhalation aerosols, metered-dose inhaler formulation, tablet compaction, pellet drug delivery, critical formulation and manufacturing variables, oral drug absorption, and novel chemical approaches for targeted drug delivery. Prerequisites: PHAR 535—Pharmaceutics or concurrently enrolled in Pharmaceutics or consent of course-master.

PHMY 577—Pharmacoeconomics (3)

This course is designed to familiarize students with the economic structure, conduct, and performance of the pharmaceutical industry. The course includes such topics as prices and profit in the industry, productivity, costs, economies of scale, innovation, economic effects of regulation, and cost benefit and cost effectiveness

analysis of pharmaceuticals. Prerequisite: One undergraduate course in economics or permission of instructor.

PHMY 580—Drugs and Public Policy (2)

An examination of public policy issues related to drug use in our society. Cases, small group discussions, and outside experts will be used to analyze contemporary issues affecting pharmacy and health care.

PHMY 581—Research Pathway Seminar (1)

The objective of this course is to provide an overview of pharmaceutical and other health- and life-science-oriented research by attending research seminars and participating in the discussion of those seminars.

PHMY 582—Advanced Patient Assessment (2)

Students will develop advanced patient assessment skills that are relevant to the provision of pharmaceutical care. At the completion of this course, the student will be able to skillfully: 1) conduct patient interviews; 2) examine patients to make diagnostic, triage, and therapeutic decisions; 3) perform simple laboratory tests; and 4) develop strategies to assess adherence to prescribed therapeutic regimens. Prerequisites: Successful completion of PHAR 541—Biopharmaceutics and Pharmacokinetics, PHAR 542—Clinical Chemistry, PHAR 554–55, 564–65—Integrated Science and Therapeutics, and PHPC 532—Longitudinal Pharmaceutical Care I or permission of coursemaster.

PHMY 583—Management of Health Care Systems (3)

This course will familiarize students with the different practice settings in integrated health systems ranging from community pharmacies to managed care organizations and hospitals. Areas that will be covered include pharmacy benefits management, disease state management, information management, models of integrated health systems, management of the therapeutic process, negotiating and networking, and the response of pharmacy practice settings to the changes in these systems. Prerequisites: PHAR 523—Ethics, PHAR 545—Practice Management, PHPC 570—Safe Medication Order Processing in Community Pharmacy Rotation, and PHPC 571—Safe Medication Order Processing in Institutional Pharmacy Rotation.

PHMY 584—Patient Counseling (2)

Students will learn key information about the Top 100 prescribed drugs in the United States. The content will focus on information that needs to be communicated to patients concerning their therapy. This material will reinforce what students have learned in other courses. In addition, students will become familiar with new product-specific material that has not been addressed in the curriculum. Periodic quizzes will assess student knowledge. The Pharmacy Practice Laboratory will also be used to videotape students as they counsel simulated patients.

PHMY 585—Perspectives of Mental Health (2)

This course provides students with an understanding of the mental health system, discusses controversies that may face the practicing pharmacist, familiarizes students with tools and techniques for studying psychopharmacologic agents, and helps to define pharmacists' roles in providing mental health care.

PHMY 586—Journal Club (2)

This elective course is abilities-based, structured in a journal club format, and parallels second-year courses. The elective provides a forum in which students can practice and enhance oral and written communication skills, literature retrieval, and evaluation activities, while learning new information relating to ongoing required coursework. Students select articles from the primary, basic, or clinical research literature and lead discussions of the articles. The discussions include study design, informational content, and how articles relate to and enhance the topics of second-year courses the students are concurrently taking.

PHMY 587—Mammal Anatomy and Histology (2)

This advanced-level elective course provides students a structured opportunity for a major dissection of two mammalian species. Students observe the location and structure of all organs of the body and their relation to each other. Working in pairs at their own pace, students systematically dissect an adult, preserved cat and a pregnant rat. Prerequisite: PHMY 590—Fetal Pig Anatomy and/or consent of coursemaster

PHMY 590—Fetal Pig Dissection (1)

This elective course provides students the opportunity to dissect a mammalian species and observe the location and structure of most organs of the body and their relation to each other. Prerequisite: PHAR 514—Human Biology I and/or consent of coursemaster.

PHMY 591—Principles and Practice of Modern Compounding (2)

Using a combination of lectures, problem-solving workshops, and skill-building laboratories, this course teaches the appropriate extemporaneous compounding of drug preparations in pharmacies. Prerequisite: PHAR 535—Pharmaceutics.

PHMY 592—Clinical Toxicology (2)

The clinical toxicology course will provide students with an overview of the clinical manifestations, assessment and treatment of poisonings with common drug, chemical, and biological agents. The format includes lectures by faculty members, case assignments, and discussions led by students. Course evaluation includes the discussion sessions, a paper on students' choice of toxicology topic, a midterm, and a final exam. Prerequisite: Third-year status. Note: This course is highly recommended as preparation for PHEX 551—Poison Information Rotation.

PHMY 593—Care of the Terminally Ill (2)

This course prepares students to interact with terminally ill patients through increased understanding of the social and psychological aspects of death and dying as well as the palliative pharmacotherapeutic management of these patients. Prerequisite: Third-year status.

PHMY 594—Introduction to Community (2)

This course engages students in service-learning through work with the ENABLE Program, relating community needs in west Baltimore City to their future role as pharmacists. Prerequisite: PHAR 532—Longitudinal Pharmaceutical Care I.

PHMY 595—Herbalism and Alternative Medicine (2)

This course explores the principles behind the botanical information and folklore uses of herbal remedies and provides an overview of alternative medicine as it is currently emerging. Alternative medicine therapies are also discussed: their rationale, safety, validity, and current therapeutic use.

PHMY 596—Nonprescription Medicine (2)

This course is designed to thoroughly familiarize the student with OTC medications. Emphasis will be placed on the pharmacology of these drugs, potential disease states in which the drugs will be used, self-administration techniques, consideration in selecting a product, triage issues, and patient counseling. Prerequisite: Third-year status.

PHMY 597—Bereavement (1)

This course addresses the skills and knowledge needed to serve bereaved individuals: the theory of attachment, loss, and grief, as well as how to effectively interact with the bereaved.

EXPERIENTIAL LEARNING ELECTIVE COURSES

The experiential learning elective (PHEX) courses currently offered by the School of Pharmacy are described below. In general, experiential electives can be taken for either 2 or 3 semester hours of credit. PHEX 5__ indicates the 2-hour elective while PHEX 5__A indicates the 3-hour elective. For example, a student registering for a 2-hour Parenteral Nutrition rotation would register for "PHEX 550" and "PHEX 550A" for the 3-hour rotation.

PHEX 540—Contemporary Pharmacy Practice (2, 3)**PHEX 541—Bone Marrow Transport (2, 3)****PHEX 542—Neurology (2, 3)**

- PHEX 550—Parenteral Nutrition (2, 3)**
- PHEX 551—Drug Information Clerkship (2, 3)**
- PHEX 552—Poison Information (2, 3)**
- PHEX 559—Research (2, 3)**
- PHEX 560—Internal Medicine (2, 3)**
- PHEX 561—Ambulatory Care (2, 3)**
- PHEX 562—Clinical Pharmacokinetics Clerkship (2, 3)**
- PHEX 563—Administration (2, 3)**
- PHEX 564—Cardiology (2, 3)**
- PHEX 565—Critical Care/Shock Trauma (2, 3)**
- PHEX 566—Critical Care/MICU (2, 3)**
- PHEX 567—Diabetes Care Management (2, 3)**
- PHEX 570—Food and Drug Administration (2, 3)**
- PHEX 571—Gastrointestinal Surgery (2, 3)**
- PHEX 572—Geriatric Pharmacotherapy (2, 3)**
- PHEX 573—Home Health Care (2, 3)**
- PHEX 574—Infectious Disease (2, 3)**
- PHEX 575—Infectious Disease/HIV (2, 3)**
- PHEX 576—Oncology (2, 3)**
- PHEX 577—Oncology/Infectious Disease (2, 3)**
- PHEX 580—Oncology/TPN (2, 3)**
- PHEX 581—Oncology/Research (2, 3)**

PHEX 582—Pediatrics (2, 3)

PHEX 583—Nuclear Pharmacy (2, 3)

PHEX 584—Chemical Dependence Treatment (2, 3)

PHEX 585—Chemical Dependence Research (2, 3)

PHEX 586—Veterinary Medicine (2, 3)

PHEX 587—Psychiatry (2, 3)

PHEX 589—Special Studies (2, 3) (Repeatable up to 12 credits.)

PHEX 589—SPEC/Investigational Drugs (2, 3)

PHEX 589—SPEC/Pharmacy Benefits Management (2, 3)

PHEX 589—SPEC/Transplant (2, 3)

PHEX 590—Community Pharmaceutical Care (2, 3)

PHEX 591—Hospice (2, 3)

NONTRADITIONAL PHARMD (NTPD) PATHWAY

The NTPD Pathway requires 30 credits, including five credits of electives. Course numbers do not reflect prerequisite sequencing of courses.

PHNT 500—General Principles of Pharmaceutical Care (3)

This course focuses on the definitions and processes of pharmaceutical care and therapeutics, including the process of therapeutic decision-making. Principles of common diseases will be covered, including oncology, infectious diseases, and cardiovascular diseases. Students in this course will also learn how to provide pharmaceutical care to individual patients (e.g., develop a pharmaceutical care database, develop a plan, and apply therapeutics principles), as well as population-based pharmaceutical care (e.g., principles of pharmacoconomics, pharmacoepidemiology and health education and promotion).

PHNT 505—Prior Learning Assessment of Pharmacy Practice (2)

The objective of this elective course is to generate a documented compilation of a candidate's experiences and accomplishments. The Prior Learning Assessment (PLA) Portfolio will be used to grant academic credit in content areas where the student has acquired competence through non-sponsored learning. Up to 10 academic credits may be awarded through the PLA process: two credits that parallel

the Terminal Performance Objectives (applied to the Pharmaceutical Care rotation and Practice Management rotation); four credits in Practice Management; and up to four credits in Pharmacotherapy. The coursemaster welcomes the opportunity to discuss the process and likelihood of credit award with students who may be interested in this elective.

PHNT 511—Practice Management (4)

Practice Management is composed of four modules: financial management, principles of management, marketing, and managing pharmaceutical care services. These modules are designed to prepare students for the practice management experiential component and to build students' practice management abilities. These credits may be earned by traditional coursework, self-study, or other faculty-approved modalities identified with the student's advisor. When appropriate, credits in this area may be awarded through the PLA process.

PHNT 512—Principles of Pharmaceutical Sciences (2)

This course will enable students to find, comprehend, analyze, and apply current and new scientific knowledge to support pharmaceutical care by expanding their foundation in pathophysiology, pharmacology, pharmaceutical chemistry, pharmacokinetics, and biopharmaceutics.

PHNT 521—Longitudinal Care (1)

This experiential course focuses on assessing the health status of a cohort of patients in the student's own practice, developing health status reports, and participating in the management of pharmaceutical care needs of these patients during health transitions. Selected patients have health care problems, such as congestive heart failure, AIDS, cancer, or problems with aging that are likely to result in health transitions requiring changing pharmaceutical care needs, including changes in drug therapy, health education, patient counseling, and physical environment (e.g., home, long-term care, hospital). It is expected that students commit a minimum of approximately 45 hours (e.g., an average of about three hours per week over a semester or 1.5 hours per week over an academic year) to experiential activities in this course at their own practice site. Students are expected to apply skills from this course in subsequent pharmaceutical care experiential coursework.

PHNT 531—Practice Management Planning (2)

Practice Management Planning will focus on the application of management principles to a pharmaceutical care service. The course will provide an opportunity for the student to develop a plan defining and justifying a pharmaceutical care service and an opportunity for implementing the plan.

PHNT 532—Patient Assessment Skills (1)

This experiential course focuses on the skills necessary to obtain general pharmaceutical care databases and problem-oriented databases from patients. Acquired skills include both history-taking and physical assessment. Learning experiences

include faculty demonstrations, videos, simulations, and patient encounters. Students are expected to apply and practice skills from this course in the program's other experiential courses.

PHNT 534—Clinic or Institutional Assignment (1)

Activities in this course include supervised development of pharmaceutical care plans, triage decision-making, discharge/transition planning, and patient counseling. Students are assigned to a total of 15 three-hour, faculty-supervised pharmaceutical care sessions.

PHNT 536—Drug Information Experience (1)

Pharmacists acquire and apply drug information skills in their own practice. Students will develop their own drug information library, access appropriate drug information databases, and utilize appropriate pharmaceutical and medical literature to prepare drug information reports. Assignments are made based upon the needs of the patients in the student's practice and the organizational needs of the practice site.

PHNT 545—Therapeutics I (3)

This course focuses on common disease entities and the development of pharmaceutical and other care plans for patients with these problems: pulmonary, neuro/psych, cardiovascular, endocrinology, and women's health. Learning experiences include discussions of pharmacotherapy, case-study analysis, adverse drug reaction analysis, discharge and transition of care planning, and development of care plans. These experiences are focused on the participant's own pharmacy practice.

PHNT 546—Therapeutics II (3)

This course focuses on common disease entities and the development of pharmaceutical and other care plans for patients with these problems. Disease states common to the following organ systems will be covered: general care, joint disease, oncology, renal disease, gastrointestinal disease, and infectious diseases. Learning experiences include discussions of pharmacotherapy, case-study analysis, adverse drug reaction analysis, discharge and transition of care planning, and development of care plans. These experiences are focused on the participant's own pharmacy practice.

PHNT 547—Medical Information Analysis (1)

This course is designed to enhance the student's skills in the areas of information collection, retrieval, analysis, and interpretation. A variety of topics surrounding drug information will be covered, including the role of informational services in health care (including managed care programs), written and verbal communication skills, research strategy and process, drug policy management, quality assurance, ethics, careers in drug information, and basic interpretation/understanding of the use of biostatistics in the medical literature. At the conclusion of this course, students will be able to: 1) retrieve medical literature appropriate to

the request; 2) evaluate the medical literature and draw conclusions necessary to make effective patient interventions/therapeutic decisions; and 3) concisely present clinical findings and answer questions about recent medical advances. Students will interact with both their peers and faculty members during this course in order to fulfill all learning objectives.

PHNT 570—Pharmaceutical Care Experience (3)

This course is designed to help practicing pharmacists build the skills needed to deliver pharmaceutical care services to patients. Students develop and implement *Triage Plans*, *Pharmaceutical Care Plans*, and *Transition Plans* for a cohort of patients (in addition to the patients accumulated during the longitudinal care experience) in their own practice. Patients selected for plan development and implementation must have at least two pharmaceutical care or pharmacotherapy problems. Students communicate these plans to other health care professionals, monitor the response of patients to these plans, make any necessary modifications, and assess patients' health outcomes of the plans. Students are expected to commit a minimum of 180 hours (an average of about six hours per week over two semesters) to activities related to this course. During this course, students will be accountable for application of pharmacotherapy topics acquired through Prior Learning Assessment and the didactic Pharmacotherapeutics course. Students completing this course will demonstrate the Nontraditional PharmD Pathway's terminal performance objectives related to implementation of pharmaceutical care services in their practice site.

PHD PROGRAM COURSE DESCRIPTIONS

PHARMACEUTICAL HEALTH SERVICES RESEARCH

PHSR 610—Pharmacy, Drugs, and the Health Care System (3)

This course examines the principle components of the U.S. health care system, with special emphasis on their relationship to the provision of drugs and pharmacy services.

PHSR 620—Social and Behavioral Aspects of Pharmacy Practice (3)

The fields of medical sociology, psychology, social psychology, and interpersonal communication will be studied as they relate to the pharmacy practice system which involves patients, pharmacists, physicians, nurses, and other health care professionals.

PHSR 650—Pharmaceutical Economics (3)

This course is designed to familiarize the student with the economic structure, conduct, and performance of the pharmaceutical industry. The course includes such topics as prices and profits in the industry, productivity, cost, economies of

scale, innovation, economic effects of regulation, cost benefit and cost effectiveness of pharmaceuticals, and efficiency of drug delivery systems. Prerequisite: One undergraduate economics course or permission of the instructor.

PHSR 670—Principles of Health Education, Health Promotion and Disease Prevention (3)

Health education is a scientific process designed to achieve voluntary behavioral changes to improve health status. Health promotion utilizes health education to promote health and prevent disease. The PRECEDE Model is used to demonstrate the analytical process to explore health problems and identify and assess the behavioral and non-behavioral factors associated with them in order to develop and evaluate interventions. This course addresses health education at the level of the individual, the family, and the community at large. Because the relationship between practitioner and patient is often a major determinant of outcome, health promotion in the clinical setting is given emphasis.

PHSR 704—Pharmacoepidemiology (3)

An introduction to the field of pharmacoepidemiology, which uses quantitative research methods to examine questions of benefit or risk in regard to the use of marketed medications. The course is intended to offer useful techniques to medical and health researchers who wish to assess the utilization, effectiveness, and safety of marketed drug therapies. Prerequisites: Introduction to Biostatistics and Introduction to Epidemiology.

PHSR 701—Research Methodologies I (3)

This course is designed to introduce the student to the concepts of scientific research in pharmacy practice and administrative science. Topics to be discussed include the scientific method and problem-solving processes, social science measurement, and several specific methods of research. Co-requisite: Introduction to Biostatistics.

PHSR 702—Health Services Research (3)

This course is being revised and the new syllabus will be formalized by fall 2001. Prerequisite: Introduction to Biostatistics (multivariate regression) or permission of the instructor.

PHSR 708—Special Problems (1-6)

This course involves students working with faculty members in numerous research or on a problem. Can be used to finish a cognate area with prior approval by curriculum committee. It can be undertaken for credit when initiated under the supervision of the student's research mentor or another faculty member. The student must register for PHSR 708. If the student opts to take that course, he or she should provide a one-page document which details the objective of the research and the deliverable expected from the project before the semester commences. This can be taken for a maximum of six credits per semester. Non-Dissertation Research Special Problems - used for all Cognate Areas.

PHSR 709—Graduate Seminar (1)

This course is a weekly seminar involving graduate students, department faculty, and participants outside the department. Must be repeated for a total of three (3) credits.

PREV 600—Principles of Epidemiology (3)

A comprehensive treatment of the concepts and methods of chronic disease epidemiology. Topics include the classification of statistical associations and the methods for distinguishing between causal and non-causal associations. Case-control, cohort, and experimental studies are considered in some detail. The course involves the presentation by students of epidemiological papers, including those linking lung cancer to cigarette smoking. Co-requisite/Prerequisite: PREV 620 or an Introduction to Biostatistics equivalent.

PREV 619—Computer-Aided Analysis of Research Data (2)

Provides the student with comprehensive experience in the application of epidemiological and biostatistical methods available in the Statistical Analysis System (SAS). Hands-on experience in weekly workshops is gained by conducting analyses of existing data designed to answer a research question. A third credit can be earned through a term project. Co-requisite/Prerequisite: PREV 620, previously or concurrently, and consent of instructor.

PREV 620—Principles of Biostatistics (3)

This course is designed to develop an understanding of statistical principles and methods as applied to human health and disease. Topics include research design; descriptive statistics; probability; distribution models; binomial, Poisson and normal distributions; sampling theory; and statistical inference. Prerequisite: Knowledge of college algebra required. Calculus recommended.

PREV 670—Psychiatric Epidemiology (2)

This elective critically reviews the methods and major substantive issues in psychiatric epidemiology. Topics include epidemiology of schizophrenia, depression, and dementia; and possible etiologic significance of socioeconomic status, stressful life events, social supports, crowding, and housing. Study designs used in conducting psychiatric epidemiological research are reviewed through lectures, seminars, and readings of current literature. Prerequisite: PREV 600 or consent of instructor.

PREV 700—Cardiovascular Epidemiology (3)

Is taught in a seminar format in which each student, with faculty guidance, chooses a current problem in cardiovascular epidemiology and, following a presentation of the problem, outlines an approach to the problem that is discussed in class. After incorporating relevant feedback, the student gives a formal presentation and submits a term paper that represents a comprehensive review of the topic. Prerequisite: PREV 600 or consent of instructor.

PREV 701—Cancer Epidemiology (3)

Is taught in a seminar format in which each student, with faculty guidance, chooses a current problem in cancer epidemiology and, following a presentation of the problem, outlines an approach to the problem that is discussed in class. After incorporating relevant feedback, the student gives a formal presentation and submits a term paper that represents a comprehensive review of the topic. Prerequisite: PREV 600 or consent of instructor.

PREV 720—Statistical Methods (4)

Course provides instruction on the specific statistical techniques used in the analysis of epidemiological data. Topics include treatment of stratified and matched data, detection of interaction, conditional and unconditional logistic regression, survival analysis, and proportional hazards models. Prerequisites: PREV 600, PREV 620, and consent of instructor.

PREV 749—Infectious Disease Epidemiology(3)

Consists of lectures, seminars, and reading assignments designed to promote an understanding of infectious disease epidemiology, with particular emphasis on modes of transmission (contact, contaminated vehicles, vector-associated, and airborne), interventions and approaches to disease control (smallpox, measles, typhoid, influenza, and hospital infections), infections of public health importance in Maryland, and use of the laboratory in infectious disease epidemiology. Prerequisite: PREV 600 and a basic knowledge of medical microbiology.

PREV 758—Health Survey Research Methods (3)

This course leads students through the steps in survey research, from developing and administering a survey questionnaire to analyzing the data. The final results of the survey are presented in a paper. Prerequisite: PREV 620 or consent of instructor.

PREV 801—Advanced Statistical Analysis (3)

This course includes maximum likelihood methods and likelihood ratio tests; topics in logistic regression analysis; Poisson regression analysis; survival analysis, including Cox proportional hazards modeling and parametric modeling; topics in matrix algebra; and longitudinal data analysis, including the multivariate linear model, profile analysis, growth curve analysis, GEE methods, and random effects models for repeated measures analysis. Prerequisites: PREV 619 and PREV 720 or consent of instructor.

PREV 803—Clinical Trials and Experimental Epidemiology (3)

This course presents a rigorous overview of the experimental method as applied in therapeutic evaluations and of causal associations between risk factors and clinical outcomes. The history of the experimental method and its clinical applications are studied in detail. Guest speakers of unique expertise and experience in clinical trials also are drawn upon. Prerequisites: PREV 600 or equivalent; at least one semester of statistics, and consent of the instructor.

Food and Drug Law Seminar (3) UMB School of Law

This seminar considers the U.S. Food and Drug Administration as a case study of an administrative agency that must combine law and science to regulate activities affecting public health and safety. The class is designed both for students who expect to become involved in food and drug matters and for those who are interested in the interplay of law and science. Topics to be discussed may include: history of the U.S. Food and Drug Administration; food law, misbranding, and economic issues; nutritional policy and health claims; regulation of carcinogens, food additives, and color additives; drug regulation; drug approval process; break-through drugs and ethics of drug testing; medical device regulation; and regulation of biotechnology. Course requirements include a seminar paper, which may be written for certification.

Courses at Other University System of Maryland Institutions/Schools

These courses may be taken in consultation with and with the approval of your advisor. See the appropriate university catalog or Web site for complete information regarding these courses.

UMBC = University of Maryland, Baltimore County

UMCP = University of Maryland, College Park

ECON 600—Policy Consequences of Economic Analysis (3) (UMBC)

ECON 601—Macroeconomic Analysis I (3) (UMCP)

ECON 601—Microeconomic Analyses (3) (UMBC)

ECON 603—Microeconomic Analysis I (3) (UMCP)

ECON 604—Microeconomic Analysis II (3) (UMCP)

ECON 605—Benefit-Cost Evaluation (3) (UMBC)

ECON 611—Advanced Econometric Methods I (3) (UMBC)

ECON 612—Advanced Econometric Methods II (3) (UMBC)

ECON 621—Quantitative Methods (3) (UMCP)

ECON 622—Quantitative Methods (3) (UMCP)

ECON 623—Econometrics I (3) (UMCP)

ECON 624—Econometrics II (3) (UMCP)

- ECON 626—Empirical Econometrics (3) (UMCP)**
- ECON 641—Economics of Government Policy Toward Business (3) (UMBC)**
- ECON 661—Macroeconomics of Public Finance (3) (UMBC)**
- ECON 661—The Corporate Firm (3) (UMCP)**
- ECON 662—Industry Structure, Conduct, and Performance (3) (UMCP)**
- ECON 663—Antitrust Policy and Regulation (3) (UMCP)**
- ECON 703—Advanced Macroeconomics I (3) (UMCP)**
- ECON 704—Advanced Macroeconomics II (3) (UMCP)**
- ECON 723—Time Series Econometrics (3) (UMCP)**
- POLI 610—American Political Institutions and Public Policy (3) (UMBC)**
- POLI 615—The American Political Arena (3) (UMBC)**
- POLI 625—The Theories of Public Administration (3) (UMBC)**
- POLI 626—The American Judiciary and Public Policy (3) (UMBC)**
- POLI 640—Health Law (3) (UMBC)**
- POLI 652—Politics of Health (3) (UMBC)**
- POSI 603—The Theory and Practice of Policy Analysis (3) (UMBC)**
- POSI 606—The Politics and Administration of Program Evaluation (3) (UMBC)**
- POSI 612—Ethics and Public Policy (3) (UMBC)**
- POSI 618—Issues in Health Care Finance and Service Delivery (3) (UMBC)**
- POSI 619—Organizational Behavior in Health Care Institutions (3) (UMBC)**

- PSYC 635—Community Psychology (3) (UMBC)**
- PSYC 645—Social Psychology (3) (UMBC)**
- PSYC 651—Cognitive Development (3) (UMBC)**
- PSYC 665—Drugs and Behavior (3) (UMBC)**
- PUAF 620—Political Analysis (3) (UMCP)**
- PUAF 640—Microeconomic Theory and Policy Analysis (3) (UMCP)**
- PUAF 641—Macroeconomic Theory and Policy Analysis (3) (UMCP)**
- PUAF 650—Normative Analysis (3) (UMCP)**
- PUAF 702—Regulatory Analysis (3) (UMCP)**
- PUAF 732—Welfare, Health Care and Affirmative Action (3) (UMCP)**
- PUAF 735—Health Policy (3) (UMCP)**
- PUAF 745—Human Health and Environmental Policy (3) (UMCP)**
- PUAF 671—Public Sector Finance (3) (UMCP)**
- SOCY 602—Intermediate Procedures of Data Analysis (3) (UMCP)**
- SOCY 651—Sociology of Health and Illness Behavior (3) (UMBC)**
- SOCY 652—Health Care Organization and Delivery (3) (UMBC)**
- 604—Biological Bases of Behavioral Development (3) (UMBC)**

ELECTIVE COURSES

POSI 607—Statistical Applications in Evaluation Research (3)
(UMBC)

PREV 619—Computer-Aided Analysis of Research Data (2)
(UMBC)

PUAF 754—Operations Research Methods for Policy Analysts (3)
(UMCP)

SOCY 630—Sociology of Aging (3) (UMBC)

SOCY 654—Comparative Health Systems (3) (UMBC)

SOCY 656—Comprehensive Health Planning for the Elderly (3)
(UMBC)

SOCY 670—American Social Institutions and the Aged (3)
(UMBC)

SOCY 671—Health and Related Social Conditions in Old Age (3)
(UMBC)

PHARMACEUTICAL SCIENCES

PHAR 600—Principles of Drug Design and Development I (1-3)

PHAR 601—Principles of Drug Design and Development II (1-3)

Describes the interrelationship among disciplines of the pharmaceutical sciences and establishes the basic theoretical background essential to the drug design and development process. Emphasizes ability development; content progresses, beginning with traditional drug design and optimization of drug structure, continuing with principles of pharmacology, pharmaceutics, biopharmaceutics, pharmacokinetics, and drug metabolism. Also covers integrative competency in the final module. This is a two-semester course divided into seven integrated modules. These modules relate the various disciplines within the pharmaceutical sciences to the drug design and development process.

PHAR 602—Biopharmaceutics/Pharmacokinetics (3)

Focuses on drug absorption, distribution, metabolism, and excretion coupled with dosage and the parameters of clearance, volume of distribution, and bioavailability. These processes determine the concentration of drug at the site of action in the body. Covers the quantitative relationship between dose and effect

as a framework to interpret measurement of drug concentrations in biological fluids, and pharmacokinetic principles using mathematical processes and descriptive parameters that describe the time course of drugs in the systemic circulation and the relationship of drug concentrations to observed effect.

PHAR 608—Introduction to Laboratory Research (1)

Students become familiar with research conducted by departmental faculty members. Rotations through the laboratory of a faculty member help students in their selection of a doctoral dissertation project. The rotation includes library work and an opportunity for participation in the experimental aspects of research. Students must take at least one laboratory rotation. Students meet with the chairs of all Research Focus Groups before selecting a rotation site.

PHAR 610—Pharmaceutical Formulation/Unit Processes (4)

Addresses the rational design and formulation of dosage forms, and the processes and equipment in their large-scale manufacture. Consideration is on how the interplay of formulation and process variables affects both the manufacturability of the dosage form and its performance as a drug delivery system.

PHAR 620—Modern Methods of Drug Delivery (3)

Focuses on the rationale for existing and future drug delivery systems. Students explore underlying physical, chemical, and biological basis for each system and identify benefits and drawbacks. Examples of delivery systems include inhalation aerosols, transdermal patches, microspheres, implants, and tablets. Emphasis is on the biopharmaceutics, and transport properties and barriers associated with each method of delivery. The course also stresses written and oral presentation skills through student presentations and paper critique sessions.

PHAR 628—Bioanalytical Separation Techniques (3)

Covers theory and applications of separation techniques used for low molecular weight compounds, such as most drugs, or for larger biopolymers, such as proteins and DNA. Also covers the separation of chiral compounds, and assay requirements and techniques for the sensitive and accurate measurement of drugs and metabolites in biological matrices, with emphasis on pharmacokinetics and biopharmaceutical applications.

PHAR 638—Pharmacometrics and Experimental Design (3)

Covers the theoretical and practical application of statistics and experimental design to help students use tools in research problems. The class discusses and uses computer programs to analyze data representing actual experimental situations.

PHAR 639—Spectrometric Methods of Pharmaceutical Analysis (3)

Introduces students to spectrometric techniques for the elucidation of molecular structure and to the analysis of pharmaceutically important materials. The

methodologies covered include ultraviolet, visible, infrared, nuclear magnetic resonance, and mass and fluorescence spectrometry. The class includes discussions of physical principles, instrumentation involved, exercises in the interpretation of spectrometric data, and examples of applications.

PHAR 648—Basic Techniques for Pharmacology Research (3)

Covers practical and theoretical aspects of basic pharmacology experimental methods. The course includes laboratory experiments to exemplify the techniques discussed in the lectures. Students write and submit reports in a selected pharmacology journal format. Topics include tissue culture, radioisotopes, signal transduction, radioligand binding, drug metabolism, protein and nucleic acid identification and quantification, electrophysiological, and *in vivo* techniques.

PHAR 653—Advanced Pharmacology I (4)

PHAR 654—Advanced Pharmacology II (4)

Pharmacodynamics is the study of the biochemical and physiological effect of drugs on biological systems. The course covers mechanisms by which pharmacological agents interact with the living organism to provide the student with a rational basis for investigations in biomedical research. Topics include the pharmacodynamics of drugs influencing the central and peripheral nervous system, and the endocrine, renal, respiratory, and cardiovascular systems. Lectures supplement weekly conferences and discussion groups.

PHAR 701—Theoretical Aspects of Liquid Dosage Forms (3)

Collates physical-chemical principles associated with liquid behavior used for pharmaceuticals. Emphasis is on the rationalization of behavior in terms of intermolecular forces. These forces manifest themselves as the cohesive forces within homogeneous liquid systems and interaction (adhesive) forces between phases. Solutions, suspensions, and emulsions are obvious examples of dosage forms whose formulation and analysis require a knowledge of the physical and chemical behavior of liquids. Fewer examples of the necessity for a foundation in liquid theory can be found on liquid-solid interactions: drying, absorption, filtration, wetting, and dissolution. Emphasis is on quantitative relationships in all areas. Students solve problems to apply these relationships to real systems to show their relevance and utility. This course provides background necessary for the design of experiments, the interpretation of results, and the promulgation of new theory regarding pharmaceutical systems that involve liquids.

PHAR 702—Theoretical Aspects of Solid Dosage Forms (3)

A survey of the performance and processing of solid dosage forms. As most pharmaceuticals are prepared from powders, emphasis is on identifying, measuring, and controlling those properties that decide the processing characteristics of powdered materials.

PHAR 708—Introduction to Pharmaceutical Sciences Seminar (1)

Includes presentations by graduate students, faculty members, and guest speakers. Students make an oral presentation on a preselected topic agreed upon by the instructor. Topics include medicinal chemistry, pharmaceuticals, pharmacology and toxicology, and pharmacokinetics.

PHAR 709—Focus Group Seminar Series (1)

Presentation and critical review of progress in research and surveys of recent developments in pharmaceutical sciences.

PHAR 729—Principles of Drug Action (3)

Advanced study of the principles of drug action, carcinogenesis, immunology, the molecular view of pharmacology, and theoretical principles and practical applications of molecular modeling. A computer laboratory is associated with molecular modeling aspect.

PHAR 747—Advanced Pharmacokinetics (3)

A detailed study of the principles of drug transport, distribution, biotransformation, binding, and excretion, with emphasis on quantitative aspects and measurement of these processes.

PHAR 751—Drug Design (3)

Applications of chemical and biological principles to the rational design of drugs. Topics include targets of biologically active molecules, approaches to studying ligand and target interactions, overview of drug discovery, agents acting on specific targets, combinatorial chemistry, computation chemistry, and structure-activity relationships.

PHAR 801—Physical Pharmacy (3)

Covers aspects of physical chemistry that relate to pharmaceutical systems. It is a logical extension of PHAR 701, with a primary focus on disperse heterogeneous systems. The design or formulation of a dosage form involves the resolution of a particular set of problems. Pharmaceutical scientists in the industry involved with these activities must bring to each situation the basic skills necessary to address the set of problems. Students experience resolving problems in terms of basic principles. Topics include colloids, rheology, surface chemistry, emulsions, suspensions, complexation, and distribution phenomena.

PHAR 858—Special Topics (1-6)

Students examine an issue of pharmaceutical importance through readings, discussions, and limited investigations. The student and instructor decide the research problem and amount of credit before the start of the study.

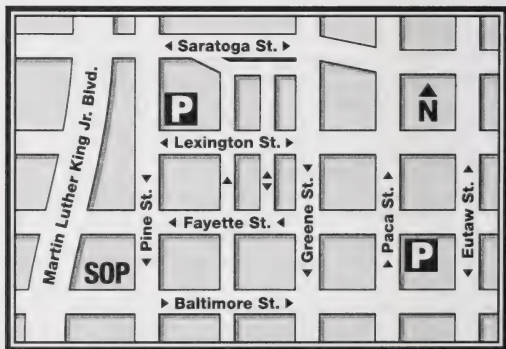
PHAR 899—Doctoral Dissertation Research (1-3)

TO REACH THE SCHOOL OF PHARMACY

School of Pharmacy
University of Maryland
20 N. Pine St.
Baltimore, MD 21201
410-706-7650
800-852-2988

Directions

From I-95: Take 95 to exit Rte. 395 (downtown Baltimore) Martin Luther King Jr. Blvd. (MLK). Stay in the right lane after exiting onto MLK. At the fourth traffic light, turn right onto Baltimore Street. (The School is on the left at the corner of MLK and Baltimore Street.) Turn left at the 2nd traffic light onto Paca Street (get into right lane) and enter the Baltimore Grand Garage on your right. There is limited metered parking on the streets around the School.



University of Maryland Baltimore



- AB** Administration Bldg.
737 W. Lombard St. **K2**
- AHB** Allied Health Bldg.
100 Penn St. **K3**
- AC** Athletic Center (Pratt St. Garage) **L4**
- BSU** Baltimore Student Union
621 W. Lombard St. **K6**
- BIO** Biomedical Research Facility
108 N. Greene St. **E6**
- BRB** Bressler Research Bldg.
655 W. Baltimore St. **H3**
- BRM** Babe Ruth Birthplace/
Museum **N5**
- CB** Century Bldg.
506 W. Fayette St. **E8**
- DH** Davidge Hall
522 W. Lombard St. **J7**
- DCCC** Downtown Child Care Center
237 N. Arch St. **B5**
- NMD** Dr. Samuel D. Harris Nat'l
Museum of Dentistry
31 S. Greene St. **J7**
- EH** East Hall
520 W. Lombard St. **J7**
- EHS** Environmental Health &
Safety Bldg.
714 W. Lombard St. **J2**
- GL** Gray Lab
520 W. Lombard St. (rear) **J7**
- GSB** Greene St. Bldg.
29 S. Greene St. **I7**

- HHH** Hayden-Harris Hall
(Dental School)
666 W. Baltimore St. **F3**
- HSF** Health Sciences Facility
685 W. Baltimore St. **H3**
- HSFII*** Health Sciences Facility II
700 W. Lombard St. **J3**
- HS/HSL** Health Sciences and Human
Services Library
601 W. Lombard St. **L6**
- HGB** Homer Gudelsky Bldg.
Lombard & Greene Sts. **J6**
- HL** Hope Lodge 636 W.
Lexington St. **C4**
- HH** Howard Hall
660 W. Redwood St. **H4**
- JTFB** James T. Frenkil Bldg.
16 S. Eutaw St. **I9**
- LS-MLL** Law School-Marshall Law
Library
111 S. Greene St. **K7**
- L-SW*** Law-Social Work Bldg.
500 W. Baltimore St. **G7**
- LM** Lexington Market **C7-9**
- LB** Lombard Bldg. 515 W.
Lombard St. **K7**
- LSB*** Lombard St. Bldg. **J5**
- MCPO** Market Center Post Office
D6
- MBC** Maryland Bar Center
520 W. Fayette St. **E7**

- MIEMSS** Maryland Inst. for Emergency
Medical Services Systems
653 W. Pratt St. **M4**
- MPA** Maryland Pharmacists
Association
650 W. Lombard St. **J4**
- MBIO** Medical Biotechnology
Center
721 W. Lombard St. **K2**
- MSTF** Medical School Teaching
Facility
685 W. Baltimore St. **H2**
- NS** Nursing School
655 W. Lombard St. **K5**
- OP** Oriole Park at Camden Yards
O10
- OSPC** Old St. Paul's Cemetery **I2**
- PR** Pascault Row
651-665 W. Lexington St. **D3**
- PH** Pharmacy Hall
20 N. Pine St. **G2**
- PLC** Pharmacy Learning Center
110 N. Pine St. **E2**
- PSPS** Pine St. Police Station
214 N. Pine St. **C2**
- RMH** Ronald McDonald House 635
W. Lexington St. **D4**
- SSTS** Saratoga St. Transfer Station
663 W. Saratoga St. **B3**
- SSW** School of Social Work
525 W. Redwood St. **I7**
- STC** Shock Trauma Center
Lombard & Penn Sts. **I4**
- SMEX** State Medical Examiners
Bldg.
111 Penn St. **L4**
- UMFM** Univ. of MD Family Medicine
29 S. Paca St. **J9**
- UMMC** Univ. of MD Medical Center
22 S. Greene St. **H5**
- UMPB** Univ. of MD Professional Bldg.
419 W. Redwood St. **I9**
- UP** University Plaza **H7**
- USB** University Square Bldg.
11 S. Paca St. **H9**
- VAMC** Veterans Affairs Medical
Center 10 N. Greene St. **G6**
- WPCC** Walter P. Carter Center
630 W. Fayette St. **E4**
- WMH** Westminster Hall
529 W. Fayette St. **F7**
- 100NE** 100 N. Eutaw St. **E9**
- 100NG** 100 N. Greene St. **E6**
- 405R** 405 W. Redwood St. **Bldg. I9**
- 410WF** 410 W. Fayette St. **E9**
- 502F** 502 W. Fayette St. Bldg. **E8**
- 701P** 701 W. Pratt St. Bldg. **M3**

- PARKING**
- PCS** Parking and Commuter Services
Office 622 W. Fayette St. **E5**

Employee, Student, Visitor, Patient

- Baltimore Grand Garage **F9**
- Dental Patient Parking Lot **F4**
- Koester's Lots **C4, C5**
- Lexington Garage **C3**
- Pearl Garage **E5**
- Penn St. Garage **L3**
- Pratt St. Garage **L5**
- University Plaza Garage
(underground) **H7**
- PUBLIC PARKING

* under construction

STUDENT RIGHT-TO-KNOW AND CAMPUS SECURITY ACT

The Student Right-to-Know and Campus Security Act (Public Law 101-542), signed into federal law November 8, 1990, requires that the University of Maryland make readily available to its students and prospective students the information listed below.

To obtain any of this information, check the appropriate space(s), fill in your name, mailing address, and school and program name, tear off this form and send it to:

Office of Student Services
Attention: Student Right-to-Know Request
University of Maryland
621 W. Lombard St., Room 302
Baltimore, MD 21201

Complete and return this portion

- Financial Aid
- Costs of Attending the University of Maryland
- Refund Policy
- Facilities and Services for Students with Disabilities
- Procedures for Review of School and Campus Accreditation
- Completion and Graduation Rates for Undergraduate Students
- Loan Deferral Under the Peace Corps and Domestic Volunteer Services Act
- Campus Safety and Security
- Campus Crime Statistics

Name _____

Address _____

School and Program _____



University of Maryland
School of Pharmacy
20 North Pine Street
Baltimore, Maryland 21201
410-706-7650
800-852-2988
www.pharmacy.umaryland.edu



UNIVERSITY OF MARYLAND
SCHOOL OF PHARMACY

2003 - 2005 Catalog



2003–2005 Catalog
Doctor of Pharmacy (PharmD) Program
Pharmaceutical Health Services Research Doctor of Philosophy (PhD) Program
Pharmaceutical Sciences Doctor of Philosophy (PhD) Program

School of Pharmacy
University of Maryland
20 N. Pine St.
Baltimore, MD 21201-1180

Program Information:

PharmD Admissions Office	410-706-7653 or 800-852-2988 (Toll Free) <i>PharmDhelp@rx.umaryland.edu</i>
E-mail:	
Nontraditional PharmD Pathway Information	410-706-0761
Pharmaceutical Health Services Research (PhD) Program	410-706-0879
Pharmaceutical Sciences (PhD) Program	410-706-0549
Dean's Office	410-706-7650
University Financial Aid Office	410-706-7347
Development Office	410-706-5893
Web site	<i>www.pharmacy.umaryland.edu</i>

The University of Maryland is accredited by the Middle States Association of Colleges and Schools. The School of Pharmacy's Doctor of Pharmacy (PharmD) and continuing education programs are accredited by the American Council on Pharmaceutical Education. For additional information, write ACPE, 311 W. Superior St., Chicago, IL 60610 or call 312-664-3575. The School is a member of the American Association of Colleges of Pharmacy.

The School reserves the right to make changes in requirements for admission, curriculum, standards for advancement and graduation, and rules and regulations.

NOTE: Notwithstanding any other provision of this or any other University publication, the University reserves the right to make changes in tuition, fees and other charges at any time such changes are deemed necessary by the University and the University System of Maryland Board of Regents.

The University of Maryland School of Pharmacy is committed to providing equal education and employment opportunity in all of its programs.

The University and the School of Pharmacy do not discriminate on the basis of race, color, religion, age, ancestry or national origin, gender, sexual orientation, physical or mental disability, marital status, or veteran status. Exceptions are as allowed by law, for example, due to bona fide occupational qualifications or lack of reasonable accommodations for disabilities.

Produced by the University of Maryland Office of External Affairs, 2003.

2003–2005 Catalog

University of Maryland
School of Pharmacy



Message from the Dean

Drugs play a key role in modern health care to help people get and stay well. Pharmacy is the profession that works with patients and their physicians to make the best use of medications. The University of Maryland School of Pharmacy offers several programs to prepare individuals for the practice of pharmacy or for independent basic or clinical research. Whether you are interested in becoming a pharmacist, obtaining a residency in pharmacy practice or a clinical specialty, or pursuing graduate studies in the pharmaceutical sciences, pharmaceutical health services research, or the clinical sciences, the School provides the gateway to unparalleled education and unlimited possibilities.

Our Doctor of Pharmacy (PharmD) program emphasizes problem-solving and critical thinking and qualifies the graduate for national and state licensing exams. Maryland students learn to practice as patient-oriented healthcare providers who can work as part of a multi-professional health care team. The curriculum is innovative and flexible. PharmD students can choose from many electives, explore pathways that focus on areas of interest, and seize opportunities to work closely with members of our large and excellent faculty. To round out their education, students elect practice rotations from among hundreds of preceptors working in every imaginable setting in which pharmacy is the focus.



In addition to our PharmD program, we offer graduate programs in Pharmaceutical Sciences and Pharmaceutical Health Services Research. Our PhD students develop the knowledge and skills necessary to conduct independent research. Our graduates go on to direct the discovery, development and delivery of medications for safe and effective therapy as well as to improve pharmaceutical outcomes and geriatric care. They find careers in academia, the pharmaceutical industry, and government institutions.

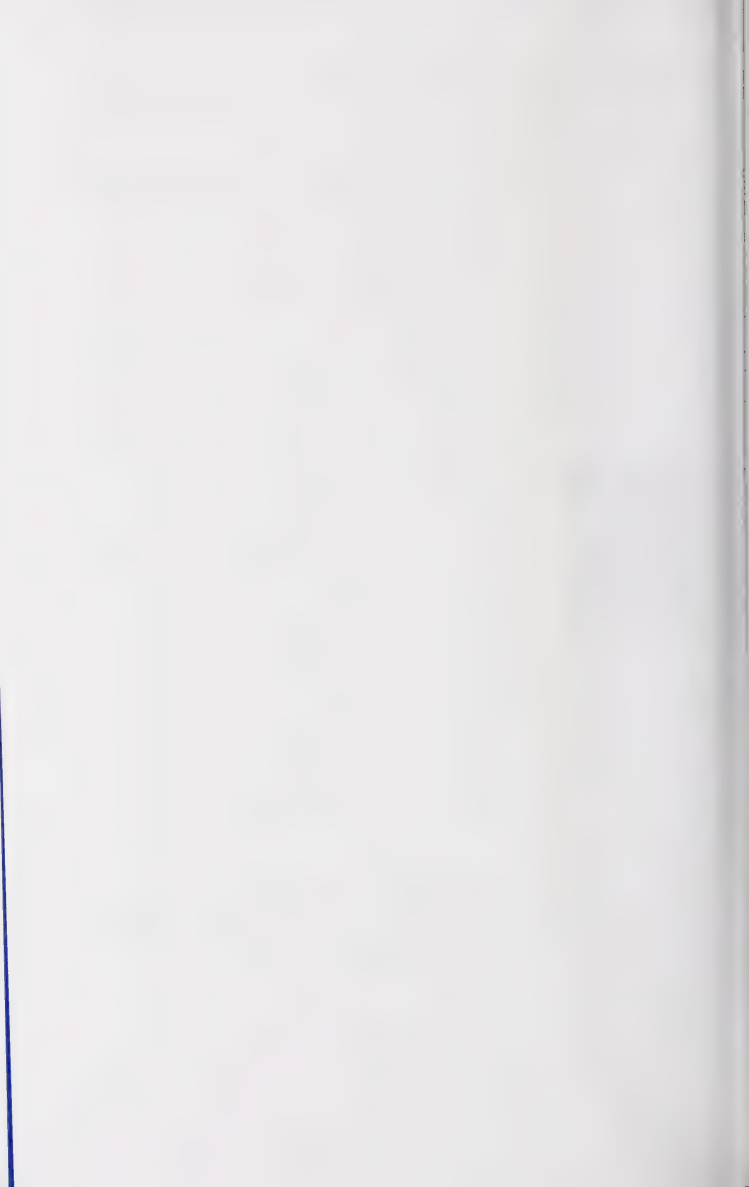
The mission of the University of Maryland School of Pharmacy is to improve the health and well being of people through excellence in education, scholarship, pharmaceutical care and public service. It is our vision to be an international leader in these endeavors.

This catalog serves as a starting point and a reference for information about the University of Maryland School of Pharmacy. The content of this catalog may also be found on our Web site at www.pharmacy.umaryland.edu, where you will find the latest information, as well as news and other features about our School. Please visit our website to supplement this catalog.

David A. Knapp, PhD

Dean

University of Maryland School of Pharmacy



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The School of Pharmacy

HISTORY

The University of Maryland School of Pharmacy has a rich and distinguished heritage. First incorporated as the Maryland College of Pharmacy on January 27, 1841, it is the oldest pharmacy school in the South and the fourth oldest in the country. Primarily an independent institution until 1904, the Maryland College of Pharmacy then became the Department of Pharmacy of the University of Maryland. In 1920, the University of Maryland in Baltimore merged with the Maryland State College at College Park to form the State University. Today, the School of Pharmacy is one of six professional schools and a graduate school that comprise the University of Maryland in downtown Baltimore.

Throughout its history, the School of Pharmacy has been a local and national leader for the profession of pharmacy. It was a founding member of the American Association of Colleges of Pharmacy, the professional organization established to formulate uniform standards for the graduation of pharmacy students. The School was also instrumental in the formation of the American Council for Pharmaceutical Education, the national accreditation organization for schools of pharmacy.

In 1970, through the efforts of the School and the Maryland Board of Pharmacy, Maryland became the first state to replace unstructured internships with a professional-experience program incorporated in the School's curriculum, setting a national standard for professional pharmacy education. In 1980, the School established a Center for the Study of Pharmacy and Therapeutics for the Elderly, now the national model for pharmacy geriatric education. In the 1990s, Maryland again set a benchmark for the nation by implementing a pace-setting Doctor of Pharmacy (PharmD) program.

MISSION

The mission of the University of Maryland School of Pharmacy is to improve the health and well being of the citizens of Maryland and beyond, through excellence in pharmaceutical education, scholarship, pharmaceutical care, and public service.

VISION

- The University of Maryland School of Pharmacy will be recognized as an international leader in innovation and excellence in education, scholarship, pharmaceutical care, and public service.
- We will attract and mentor students to attain their fullest potential.
- We will recruit and develop faculty to serve as exemplary role models.

- We will foster an environment for learning and productivity that will guarantee the fullest contributions of a diverse faculty, staff, and student body.
- We will collaborate with partners both within and outside the University to achieve this vision.

COMMITMENT TO DIVERSITY

The School seeks an applicant pool and a student body that is diverse in terms of race, sex, age, geographic and economic background, religion, and ethnicity. The 2003 enrollment statistics reflect the diversity of the student body: 38 percent Caucasian, 36 percent Asian, 17 percent African-American, 7 percent International, 2 percent Hispanic, and less than 1 percent Native-American.

COMPLIANCE WITH ADA LEGISLATION

In accordance with the Americans with Disabilities Act of 1990, the School examines all aspects of its programs and services to ensure accessibility to qualified students with disabilities. From recruitment to commencement, the School strives to create an environment that respects individual differences while challenging students to perform to their optimal ability. Modifications tailored to the needs of the diverse student population include applications, brochures, course materials and examinations offered in alternate formats, and modified lengths of time to complete degree requirements. Equally important, the administration reviews organizational activities that would prohibit participation by students with disabilities and provides services for these students to ensure their rights and protection under the law. With increased use of computer technology, the School makes information more accessible and is better able to serve students with disabilities.

ADMINISTRATIVE OFFICES

ACADEMIC AFFAIRS

The Office of Academic Affairs provides leadership and administrative management in all professional education programs. The associate dean for academic affairs provides oversight of professional curricula, including pathways, experiential learning, and joint degree programs, and is responsible for: scheduling, educational technology, appointment of graduate teaching assistants, liaison with other academic units of the University, and continuing professional education. The associate dean for academic affairs is also responsible for program assessment and meets with the Educational Advisory Committee, composed of members of the external professional pharmacy community, to identify and discuss important

issues affecting the educational programs at the School and to provide advice on those issues. Also, this associate dean coordinates initiatives in the international arena that deal with pharmacy education. The School's Student Discipline and Grievance Committee handles issues surrounding academic integrity and student behavior.

FINANCE AND ADMINISTRATION

The Finance and Administration Office is directed by the associate dean, who is also the chief financial officer for the School. The office provides leadership and oversight of support services necessary for the School to carry out its mission. The following units and positions are part of the team that helps deliver support services: Facilities and Laboratory Support Services, Computer and Network Services, the Integrated Business Services, and the Dean's office staff.

DEVELOPMENT

The Development Office is responsible for identifying and raising funds from private sources to include individuals, corporations and foundations. Working closely with the Dean, the Board of Visitors, alumni, and faculty, fundraising efforts are focused on garnering support for student scholarships and faculty support.

ALUMNI LIAISON

The position of Alumni Liaison provides school-based support to the Alumni Association as it plans Reunion Weekend, the Alumni Golf Tournament, the Graduation Banquet and other activities to promote the School to its constituencies. The Alumni Association also assists with the student admissions process and provides academic scholarships to eight students per academic year.

PUBLICATIONS

The Assistant to the Dean is responsible for producing School and alumni publications and for disseminating to the public relevant news and information regarding the activities of its faculty, students, and alumni.

STUDENT AFFAIRS

The Office of Student Affairs provides a variety of services to enhance the student learning experience and to provide support to students during their academic career. The School's student affairs system is under the direction of the associate dean for student affairs and the director of student services. The office includes a coordinator of recruitment and admissions along with three professional staff. The office is responsible for recruitment, admission, and graduation of PharmD

students and is involved with veteran affairs, financial aid, student leadership development, and counseling programs. Other services include personal counseling, advising and tutoring systems, career development, and special programs, such as the Open House.

The office monitors the activities of the School's student organizations that operate under the Student Government Association (SGA) umbrella. The SGA, as well as each organization, has a faculty advisor who assists in planning and organizing the group. The SGA holds biweekly meetings and arranges an impressive array of activities.

The Student Affairs Committee addresses academic issues. Both of these committees are composed of students and members of the faculty and Office of Student Affairs. The office administers the career development program for PharmD students and attempts to increase student awareness of job opportunities. For more information about the Office of Student Affairs, see www.pharmacy.umaryland.edu/StudentAffairs/.

DEPARTMENTS

PHARMACEUTICAL HEALTH SERVICES RESEARCH

The Department of Pharmaceutical Health Services Research mission is to focus on behavioral sciences, pharmacoeconomics, pharmacoepidemiology, and pharmaceutical policy teaching, service, and community outreach. To help the department reach its goals are The Center on Drugs and Public Policy and The Office of Substance Abuse Studies. (See descriptions under Centers and Resource Programs in this catalog.) Additionally, the department values excellence in teaching, research, service, and the contributions of its members to the department, School, University, state, profession, and health care community.

PHARMACEUTICAL SCIENCES

The Department of Pharmaceutical Sciences mission is to advance the field of Pharmaceutical Science through state-of-the-art research and discovery in the areas of cellular and chemical biology, neuroscience, pharmacology, and biopharmaceutics and drug delivery. This multidisciplinary research develops new methodologies for drug discovery that identify targets for drug development, develops new pharmacotherapeutic agents and develops and optimizes new drug delivery systems. Pharmaceutical Sciences is committed to the innovative education of graduate and professional students through a scientifically integrated program to become outstanding pharmaceutical scientists and pharmacists. Furthermore, the department is committed to serve the needs of the School, University, and community.

PHARMACY PRACTICE AND SCIENCE

The Department of Pharmacy Practice and Science promotes the health and well being of the public by advancing the practice of pharmacy and generating and disseminating new knowledge related to pharmacy practice and drug use. The department approaches these goals by: 1) preparing professional students, graduate students, residents, fellows, and pharmacists for the future through a variety of academic, training, and mentoring programs; 2) providing an environment conducive to the development of faculty and staff; 3) furnishing expertise, support, and leadership to professional, governmental, community, and health-related organizations and agencies; 4) fostering research into the clinical and social sciences related to pharmacy practice and drug use; 5) encouraging the development of new and innovative pharmacy practice and role models; and 6) providing a structure that supports these efforts. The department values excellence in teaching, practice, research, and service, and the contributions of its faculty and staff to the department, School, University, state, profession, and health care community.

LECTURE SERIES

The School supplements its regular curriculum with the following special lectures and symposia:

Francis S. Balassone Memorial Lecture. The Maryland Pharmacists Association, the School of Pharmacy Alumni Association, and the School sponsor this lectureship as a memorial to Francis S. Balassone. He was a 1940 graduate of the School, a past president of the Alumni Association, a distinguished former faculty member, and a past president of the National Association of Boards of Pharmacy.

Dean's Colloquium. The Dean's Colloquium brings together students, faculty members, and nationally recognized scientists and clinicians to discuss contemporary issues of relevance to pharmacy and health care. These seminars provide unusual opportunities for interaction and exchange of new information on topics related to pharmacy practice and science.

Andrew G. DuMez Memorial Lecture. This lectureship was established in 1969 by Mrs. DuMez in memory of her husband, Dr. Andrew G. DuMez. Dean of the School of Pharmacy from 1926 to 1948, Dr. DuMez was a distinguished educator and leader in pharmacy in Maryland, the United States, and around the world.

Ellis Grollman Lecture in Pharmaceutical Sciences. Mrs. Evelyn Grollman Glick funded a lecture program in memory of her brother, Ellis Grollman, in 1983. He was a 1926 graduate of the School. Each year a nationally recognized researcher in the pharmaceutical or related basic sciences is invited to present this lecture.

Peter P. Lamy Lecture. The Peter P. Lamy Lecture was inaugurated in 1992 in recognition of Dr. Lamy's career as an internationally recognized authority on geriatrics and gerontology. This lecture provides an opportunity for pharmacists to discuss critical issues in the care of the nation's elderly.

Paul A. Pumpian Lecture Fund. This lectureship was established in 1993 by Mr. Pumpian, a former professor at the School. The lecture brings distinguished leaders to the School to discuss healthcare policy issues affecting the nation.

ENDOWED CHAIRS

The School has the following endowed chairs:

The **Emerson Professorship in Pharmacology** was endowed in 1927 as a chair in Biological Testing and Assay by Captain Isaac Emerson, president of the Emerson Drug Company. The first chair was filled by Dr. Marvin Thompson, a pharmacologist at the Food and Drug Administration at the time. Dr. Clifford W. Chapman, a pharmacologist from the Canadian National Laboratories, was appointed to the chair in 1938. Dr. Casimer Ichniowski and Dr. Naim Khazan were the third and fourth appointees to the chair. In 1988, Dr. Gerald M. Rosen was appointed Emerson Professor. His appointment as Emerson Professor led to Dr. Rosen being named an Eminent Scholar by the Maryland Higher Education Commission.

The **Evelyn Grollman-Glick Professorship in the Pharmaceutical Sciences** was established in April 2003 through the bequest of the late Evelyn Grollman. In 1983, Evelyn Grollman established a Lecture Fund in honor of her brother, Ellis Grollman, a 1926 graduate of the School. The endowed professorship will be used to recruit an eminent pharmaceutical scientist to further strengthen the School's research program.

The **Parke-Davis Chair in Geriatric Pharmacotherapy** was established in 1990 with a \$1 million gift from the Warner-Lambert Co. on the eve of the 125th anniversary of Parke-Davis and the School of Pharmacy's 150th Anniversary. The endowment underwrites the School's continuing commitment to geriatric pharmacotherapy as exemplified by the accomplishments of the late Peter P. Lamy, the first holder of the Parke-Davis Chair. Dr. Bruce C. Stuart is current holder of this chair.

The **Ralph Shangraw Endowed Chair in Pharmaceutical Sciences** was established in June 1995 by Colorcon and the University of Maryland School of Pharmacy in honor of the retirement of Ralph Shangraw. The endowment will be used to support a Professorship in Pharmaceutical Sciences until the fund has reached full funding and then will support an endowed chair.

CENTERS AND RESOURCE PROGRAMS

The **Biomedical Chemistry NMR Center** houses a GE 300 MHz nuclear magnetic resonance spectrometer. The superconducting magnet, the heart of the instrument, is permanently immersed in a vacuum-jacketed reservoir of liquid helium (-260°C) and allows the detection and accurate determination of protons, ^{13}C , ^{31}P and other nuclei of biological importance. The NMR was the first instrument of its kind on campus, and it opened up many new avenues of research within the School, greatly increasing the number of inter-school collaborative ventures.

The **Center on Drugs and Public Policy** contributes to informed debate of drug policy issues in our society. CDPP research and educational programming has provided thought-provoking analysis and focused dialogue on drug use and public policy since 1987. The CDPP specializes in providing credible, unbiased,

and pragmatic solutions for government agencies, the pharmaceutical industry, professional organizations, and private businesses on public health issues and practices involving medication use and regulatory matters.

The **Drug Information Center** provides comprehensive medical information to contract affiliated institutions and the general public. The provision of service includes, but is not limited to, patient-specific and adverse drug reaction consultations, guidelines for use, formulary monograph/review preparation and management, and newsletter support. The UMDI and its staff are also charged with the education of UMB pharmacy students in the practice of medical literature analysis. Students are educated on the proper utilization of online databases and search strategies in the hope of making them more proficient in the assimilation of information. The UMDI also participates in an ongoing Internet Drug Information Service, which provides online users the ability to submit questions to qualified pharmacy staff. These questions are not limited in any way to geographic region or subject. The UMDI answers each question on an individual basis, usually within three business days, many within hours.

The **ENABLE** Community Health Worker Program recruits and trains community residents to be Community Health Workers (CHWs). They receive intense training in chronic illness, case management, resource identification, and community outreach. Once trained, they are placed in local clinics and schools, identify clients in need, win their clients' trust, identify their symptoms, teach them preventive measures, and make sure clients keep regular doctors' appointments and follow treatment regimens. The mission of ENABLE CHW is to serve community residents, to enable them to improve their health outcomes through home-based individual care, case management, education, monitoring, and follow-up.

The **Peter Lamy Center on Drug Therapy and Aging** serves as the focal point for geriatric research, education, and service within the University of Maryland School of Pharmacy. The center is dedicated to improving drug therapy for aging adults through innovative research, education, and clinical initiatives. The center produces new scientific knowledge with practical applications for improving outcomes of pharmaceutical care for elderly patients. The center provides students, practitioners, and other caregivers with up-to-date and accessible information on best practices in geriatric pharmacotherapy. The center also works to strengthen the tie between education and practice by giving faculty members and pharmacy residents opportunities to apply principles of pharmaceutical care to older patients in various settings.

The **Maryland Poison Center** has been a service program of the University of Maryland School of Pharmacy since 1972. The service has grown and changed quite a bit over the years. During its first year, the Maryland Poison Center received 5,600 calls. In 1998, the center fielded more than 60,000 calls. Despite the increase in call volume, the center's commitment to providing the best quality poison triage, treatment, education, and prevention services has never changed.

The Maryland Poison Center is certified by the American Association of Poison Control Centers (AAPCC) as a regional poison center providing poisoning triage, treatment, education, and prevention services to all Marylanders. This ser-

vice is staffed by pharmacists and nurses who have specialized clinical toxicology training 24 hours a day, every day of the year. All of the specialists have been certified by the AAPCC as specialists in poison information. On average, each specialist has more than six years of experience managing poisoning and overdose cases. In addition to the knowledge, skill, and experience of the poison specialists, the director of the program is board certified in clinical toxicology and the medical director is boarded in emergency medicine as well as in medical toxicology and additional specialized consultants. For more information, call 800-222-1222.

The **Mental Health Program** of the School of Pharmacy is joint venture with the Developmental Disabilities Administration and Mental Hygiene Administration of the state of Maryland. Its primary goals are to improve and maintain all aspects of pharmacy practice within the state's mental health facilities and provide leadership in the field of psychiatric pharmacotherapy for state programs and facilities. The program also serves as a site for pharmacotherapeutic and administrative research in mental health, a testing ground for innovative strategies in mental health pharmacy practice and a training resource for mental health-related issues. Members of the School's faculty serve at eight mental health sites around the state.

The **Office of Substance Abuse Studies** (OSAS) was founded in 1986. Its mission is to improve programs of substance abuse treatment and prevention and to explore the intersection of substance abuse and pharmacy practice in our society—how do the problems of substance abuse impact the practice of pharmacy and how can the profession of pharmacy help solve the problems of substance abuse. OSAS is rooted in a long history of providing a range of informational and educational services to health professionals. We offer programs of prevention and community service, and engage in active research in the quest for new knowledge in the field of addictions. Academic courses, field placements, and exposure to research projects are available for students in all years of the pharmacy program. OSAS offers opportunities for graduate studies through the Department of Pharmaceutical Health Sciences Research.

STUDENT HONORS AND AWARDS

The School recognizes academic excellence during the fall and spring honors convocation. During the fall ceremony, students receive academic achievement awards in all classes, based on performance the preceding year. The School also recognizes leaders of student organizations at this time. The Rho Chi Honor Society presents its annual book award to the student(s) having the highest academic GPA. The society also awards certificates to students with GPAs above 3.25.

In the spring, the School honors its graduates. Students who graduate in the top 4 percent of their class, graduate with Summa Cum Laude honors, the next 5 percent Magna Cum Laude, and the next 6 percent Cum Laude. Faculty members present the following academic-achievement awards to members of the graduating class at the spring Graduation Convocation.

Alpha Zeta Omega Fraternity Prize, Kappa Chapter. The Kappa Chapter of the Maryland Alumni Chapter of the Alpha Zeta Omega fraternity provides a prize that is awarded to a student for proficiency in pharmacology.

Andrew G. DuMez Award. In memory of Dr. Andrew G. DuMez, former dean and professor of pharmacy, the DuMez award is given to a student for superior proficiency in pharmacy.

Lambda Kappa Sigma-Cole Award, Epsilon Alumnae Chapter. A student receives this award in memory of Dr. B. Olive Cole, former acting dean, for proficiency in pharmacy administration.

The Excellence in Pharmaceutical Care Award. The Nontraditional PharmD Pathway preceptors and mentors give this award to a student who has excelled in his/her practice setting.

School of Pharmacy Academic Excellence Awards. The students who receive this award have attained the highest general average in the entry-level program and in the Nontraditional PharmD Pathway.

William Simon Memorial Prize. In honor of the late Dr. William Simon, a professor of chemistry in the School for 30 years, a student is awarded a prize for superior work in the field of biomedical chemistry.

Frank J. Slama Award from the School's Alumni Association. In tribute to Dr. Frank J. Slama, Class of 1924, a former professor and head of the Department of Pharmacognosy, for over half a century of loyalty and service to his profession, to the School, and to the Alumni Association, the School's Alumni Association gives this award to a member of the graduating class who excelled in extracurricular activities.

Dr. and Mrs. Frank J. Slama Scholarship Fund. In memory of her husband, Dr. Frank J. Slama, former distinguished professor in the School of Pharmacy, Lillian Slama established this scholarship on August 12, 1975. A student receives this award for superior work in the field of biopharmacognosy.

Wagner Pharmaceutical Jurisprudence Prize. In memory of her husband, Manuel B. Wagner, and her son, Howard J. Wagner, both alumni of the School, the late Mrs. Sadie S. Wagner, and her daughter, Mrs. Phyllis Wagner Brill Snyder, fund a prize to a graduating student for meritorious academic achievement in pharmaceutical jurisprudence.

John F. Wannewetsch Memorial Prize. In memory of her brother, Dr. John F. Wannewetsch, a distinguished alumnus of the School, Mrs. Mary H. Wannewetsch funds a prize given to a graduating student who has exhibited exceptional performance and promise in the practice of community pharmacy.

The Conrad L. Wich Pharmacognosy Prize. In appreciation of the assistance that the Maryland College of Pharmacy extended to him as a young man, Mr. Conrad L. Wich provided a fund. The faculty assembly awards annually the income from this fund to a student who has done exceptional work throughout the course in pharmacognosy.

L.S. Williams Practical Pharmacy Prize. A bequest provided by the late L.S. Williams funds the L.S. Williams Practical Pharmacy Prize given to the student having the highest general average throughout the course in basic and applied pharmaceutics.

STUDENT ORGANIZATIONS

The School has 20 student organizations, including fraternities, professional pharmacy organizations, honor societies, a high school tutoring/mentoring program, and social organizations that perform a variety of services and activities for the profession and the community. The organizations operate under the auspices of the Student Government Association. Further information is available at:

<http://www.pharmacy.umaryland.edu/studentorg/default.htm>.

PHARMD STUDENT GOVERNMENT ASSOCIATION (SGA)

The SGA promotes the professional development of students through the process of self-government. The SGA strives to develop academic achievement, to encourage communication between faculty and students, to coordinate activities within the School, to promote educational programming, to enhance professional and social interests, and to encourage community service. All students belong to the SGA. The Executive Council of the SGA is composed of SGA officers, presidents of organizations, class officers, and the yearbook editor; and in the Council is vested the executive, legislative, and judicial power of the SGA. The Council meets periodically with School administrators to discuss important issues. At the campus level, the University Student Government Association (USGA) coordinates the activities of the Graduate School and the six professional schools. USGA representatives are elected by the students of all seven schools.

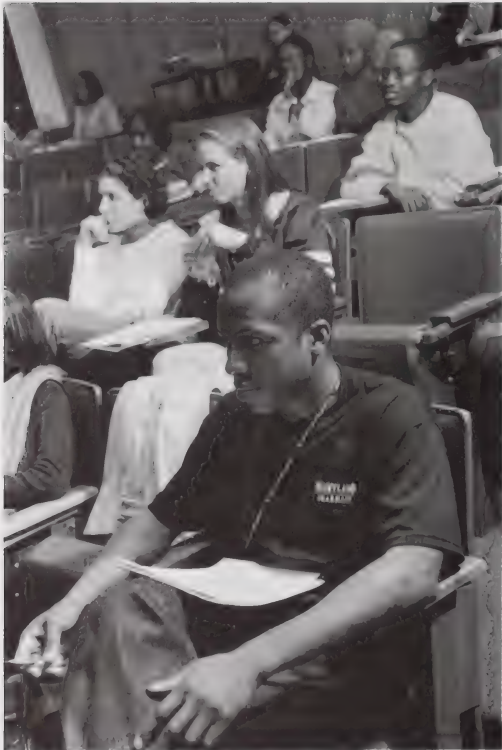
PHARMACY GRADUATE STUDENT ASSOCIATION

The purpose of the Pharmacy Graduate Student Association (PGSA) of the University of Maryland School of Pharmacy is: 1) to act as an official liaison body to communicate graduate student concerns to the pharmaceutical sciences and pharmacy administration officials of the School; 2) to provide a platform for discussions and suggestions on matters involving graduate students; 3) to communicate and support research interests of graduate students of the School; 4) to promote efficient recruitment and orientation of incoming graduate students; 5) to promote a better graduate student life; 6) to represent the interests of graduate students as members of campus-wide organizations; and 7) to recognize, foster, and reward outstanding leadership among individuals who promote PGSA ideals.

ALUMNI ASSOCIATION

The mission of the School of Pharmacy Alumni Association is to strengthen and enhance the School by fostering communications, social interactions, and a sense of pride in the School. Each year, the association sponsors a spring banquet honoring the graduating class and the 50-year class. The association also awards eight

need-based scholarships to deserving students. The association also plays a leadership role in the School's fund-raising activities. For example, many members participate in the annual phone-a-thon and are generous donors to the David Stewart Associates, the major giving club for alumni, friends, and faculty members who contribute \$1,000 or more annually to the School. For more information, visit the Alumni and Friends Web site at www.pharmacy.umaryland.edu/alumni/.



Students listen to a lecture.

The University of Maryland

The University of Maryland, located in downtown Baltimore, is the founding campus of Maryland's public university system and a thriving center of life sciences research and community service. The six professional schools and a graduate school are dedicated to excellence in professional and graduate education, research, public service, and patient care.

With \$305 million in sponsored activities for Fiscal Year 2002, the University uses state-of-the-art technological support to educate leaders in health care delivery, biomedical science, social services, and law. The campus fosters economic development in the state by conducting internationally recognized research to cure disease and to improve the health, social functioning, and just treatment of the people served. The University is committed to ensuring that the knowledge it generates provides maximum benefit to society, directly enhancing the community.

Below are places, campus departments, phone numbers, and Web addresses that may be of interest:

NAME	PHONE	WEB ADDRESS
About Baltimore		www.livebaltimore.com www.colttown.org
Counseling Center	410-328-8404	http://graduate.umaryland.edu/counseling
Dual Degree PharmD Programs		www.pharmacy.umaryland.edu/admissions/ pharmd.htm
Financial Aid	410-706-7347	www.umaryland.edu/fin/
Health Sciences and Human Services Library	410-706-7996	www.hshsl.umaryland.edu
Housing On/ Off-campus	410-706-7766	www.housing.umaryland.edu
Parking and Commuter Services	410-706-6603	www.parking.umaryland.edu
Pharmaceutical Health Services Research Department	410-706-0133	www.pharmacy.umaryland.edu/PHSR/
Pharmaceutical Sciences Department	410-706-1560	www.pharmacy.umaryland.edu/pscl

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NAME	PHONE	WEB ADDRESS
Pharmacy Practice and Sciences Department	410-706-7613	www.pharmacy.umaryland.edu/PPS/
Records & Registration	410-706-4053	http://admincomp.umaryland.edu/orr/index.html
School of Pharmacy Calendar of Events		www.pharmacy.umaryland.edu/apps/calendar/
School of Pharmacy Faculty Web Sites		www.pharmacy.umaryland.edu/faculty/
School of Pharmacy Student Affairs (PharmD)	410-706-7653	www.pharmacy.umaryland.edu/StudentAffairs/
School of Pharmacy Dean's Office	410-706-7651	www.pharmacy.umaryland.edu/Deans/
Student Answer Book		www.umaryland.edu/student/sab/
Student & Employee Health Appointment	410-328-6645	
Doctor on-call	410-328-8792	www.umaryland.edu/health/
Washington, DC		www.district-of-columbia.com

Doctor of Pharmacy (PharmD) Program

The Doctor of Pharmacy (PharmD) Program at the University of Maryland has been developed in partnership with practitioners from all areas of pharmacy and emphasizes problem solving, critical thinking, patient-focused content, and experiential opportunities across the breadth of practice. Due in part to this innovative curriculum, the School is ranked seventh among the nation's 84 pharmacy schools. In addition to the full-time day PharmD program, the School offers a Nontraditional PharmD Pathway as a mechanism for licensed, practicing pharmacists to earn the PharmD degree. The School uses a rolling admissions process. Information about the PharmD program can be viewed on the School's Web site: www.pharmacy.umaryland.edu.

GOALS OF THE DOCTOR OF PHARMACY CURRICULUM

The goals and objectives of the PharmD program are consistent with the School's strategic plan:

- The School of Pharmacy seeks to help individuals gain the knowledge and skills necessary to begin pharmacy practice, and in so doing, accept and perform professional responsibilities with competence. Graduates should have the ability to adapt their practice to the changing health care system and should be prepared to engage in a continuing program of professional development.
- The professional curricula will be innovative and flexible, based on strong basic sciences, have extensive clinical content taught by practice-based faculty members and emphasize the development of problem solving and collaborative skills. The curricula also will provide the opportunity for advanced professional and clinical education.
- The School seeks to create an educational community that extends beyond traditional classroom sites and offers students and faculty members a variety of learning environments. These will include cultural and interprofessional programs which broaden the experiences of our graduates.

GENERAL ADMISSIONS INFORMATION

Admissions and application information for the PharmD Program may be obtained by visiting the PharmD Prospective Student Web site at: <http://www.pharmacy.umaryland.edu/admissions/>.

Inquiries about the admissions process may be sent by e-mail to PharmD-help@rx.umaryland.edu. The admission, application, and programs information for the PharmD programs are as follows:

Admissions Information

An admissions committee comprised of faculty members and students reviews official transcripts and PCAT results to make admissions decisions. Applicants with strong academic credentials and PCAT scores are invited to interview with faculty members, alumni, and students. During the interview, the applicant is assessed on factors such as professional and social awareness, verbal and written communication skills, integrity, maturity, and motivation. Following the interview, the admissions committee makes a decision based on the applicants' academic achievement, PCAT scores, and qualities evaluated during the interview. Academic achievement and/or high PCAT scores do not, in themselves, ensure acceptance.

While a minimum GPA of 2.5 (A=4.0) is required for admissions consideration, the average entering GPA of the fall 2003 first-year PharmD students was 3.5. Average PCAT scores of admitted students were above the 80th percentile in each of the five areas of the exam. Competition for admission is high, and applicants with GPAs below 2.9 have an extremely low probability of admission. All applicants must present evidence (via official transcripts) of having completed the prepharmacy coursework with grades of at least a C or better.

PRE-PHARMACY COURSEWORK

Applicants must complete a minimum of 63 semester hours of coursework of pharmacy prerequisites for admission into the PharmD program. At least one semester of this coursework must be taken at an accredited institution in the United States. To enroll in **pre-pharmacy** coursework, applicants must apply directly to an accredited college or university, not to the School of Pharmacy. Most institutions have designated prepharmacy programs and advisors. The School of Pharmacy does not provide any specific information regarding course content and/or requirements for admission into these prepharmacy programs. Prerequisites for admission into the PharmD program are as follows:

COURSE	TYPICAL # OF SEMESTERS	TYPICAL # OF CREDIT HOURS
English (Comp/Lit)	2	6
Calculus	1	4
Statistics	1	3
Biology	1	4
Microbiology	1	4
General Chemistry	2	8
Organic Chemistry	2	8
Physics	2	8
Humanities/Social Sciences	6	18
TOTAL		63 minimum

INTERNATIONAL STUDENT APPLICANTS

International student applicants must follow the procedure described above to apply for admission to the PharmD program. Additionally, students who are not citizens or permanent residents of the United States must submit the results of the TOEFL, certified official copies of transcripts, a statement of financial support, a supplementary information sheet, and a summary of educational experiences. These must be submitted directly to PharmCAS. International students are also required to take the PCAT. Therefore, it is essential that international students start the admissions process early.

The School does not accept applicants who have attended only a foreign educational institution. The School, due to its small size, cannot adequately certify international credentials and relies on the evaluation performed by other institutions. In addition, experience shows that international students benefit from taking courses at other U.S. institutions before entering our program. International students should be familiar with the rules and regulations of the Immigration and Naturalization Service, which grants admission to the United States.

INTERNATIONAL PHARMACIST APPLICANTS

International pharmacists residing in the United States are eligible to apply to the School's PharmD program and then upon graduation become eligible to complete state licensure exams. International pharmacists cannot be admitted directly from another country.

The structure of the Maryland program dictates that you must enter the first or second year of our four-year Doctor of Pharmacy program. You will probably be exempted from some courses within the curriculum based on your experiences and knowledge base. However, the manner in which all remaining courses are linked and sequenced, you cannot be admitted into the third or fourth year. Thus, you should plan at least a three-year commitment to earn the PharmD degree.

If you would like to be considered as an applicant for the program, you will need to complete an application by March 1st for admission the following Fall semester. It would be helpful to the admissions committee if you could take the PCAT exam since it identifies the relative strengths and weaknesses of our applicants. It assists in structuring an individualized educational program for you.

To request an application please visit our Web Site at www.pharmacy.umaryland.edu/admissions/pharmd and follow the application procedures for International Pharmacist.

Please note that if you are an International Pharmacist you do not apply to PharmCAS.

TRANSFER APPLICANTS

Periodically, the School of Pharmacy allows a selected number of students to transfer into Maryland's program from another school or college of pharmacy. The school limits the privilege to those students who have a valid reason for requesting transfer and who have evidence of satisfactory academic performance (at least a 3.0 professional GPA). Due to space limitation, the school cannot accept a large number of transfer students and only admits for the Fall semester. Due to complexity of the program a determination will be made by the Admission Committee as to which year you will be accepted into the program.

In order to consider your request for transfer, please follow the application procedures for transfer student at www.pharmacy.umaryland.edu/admissions/pharmd. Please note that if you are an International Pharmacist, you do not apply to PharmCAS.

APPLICATION PROCEDURE

Applicants must follow the procedure described below to apply to the PharmD. Program.

- Applicants must apply directly to PharmCAS at www.pharmCAS.org by the following deadlines:

Early Decision Applicants	September 1
Regular Applicants	March 1
- Submit the Maryland Residency Form and the \$20.00 nonrefundable processing fee to the following address:

Admissions Committee
School of Pharmacy
University of Maryland
20 North Pine Street
224 Pharmacy Hall
Baltimore, Maryland 21201-1180
- Complete the Online Supplement Information Sheet, which can be located at www.pharmacy.umaryland.edu/admissions/application.
- Pre pharmacy coursework must be completed before the start of classes in the fall semester of application with a grade of C or better.
- Take the Pharmacy College of Admission Test in October or January and forward the scores to PharmCAS.

PHARMD PROGRAM DESCRIPTION

The four-year Doctor of Pharmacy program is divided into six levels: Fundamentals, Basic Science, Pharmaceutical Science, Integrated Sciences and Therapeutics, Experiential Learning, and Curriculum Practice Interface. The academic focus of each level is described below:

Level I: Fundamentals

Students entering the PharmD program have diverse educational and life experiences. Level I addresses these diversities with introductory courses covering the concept and scope of pharmaceutical care, pharmacy practice in general, and the variety of disciplines that will contribute to pharmaceutical education. Students are provided the skills and scientific principles and concepts fundamental to subsequent curricular experiences. Students develop professional attitudes and behaviors that extend throughout the curriculum.

Level II: Basic Sciences

During Level II of the curriculum, students build on the fundamentals of Level I through a comprehensive examination of basic biological, chemical, physical, social, and behavioral sciences. These elements provide the foundation for understanding pharmaceutical sciences and the complexities of drug action and use.

Level III: Pharmaceutical Sciences

Level III addresses pharmaceutical science content areas as they relate to the needs of patients in the total health care environment. The provider of pharmaceutical care must possess a detailed and comprehensive understanding of the physical, chemical, biological, and psychosocial factors affecting the outcomes of drug therapy in specific patients with specific diseases.

Level IV: Integrated Sciences and Therapeutics

Level IV addresses the extensive interweaving of basic pharmaceutical and clinical science as well as the interrelated bodies of knowledge involved in total pharmaceutical care. Students build on their basic and pharmaceutical science background as they actively participate in a variety of didactic and laboratory experiences to design, implement, manage, and monitor individualized pharmaceutical care plans. Students learn to appreciate that the successful outcomes of drug therapies depend on complex physical, chemical, biological, and psychosocial interactions within human systems, and therefore require individualized attention to patients during the design and delivery of pharmaceutical care. This application of these principles is taught by presenting diseases of different body systems within the broader context of public health, epidemiology, prescriber education, disease prevention, and health promotion issues.

Three progressive components are used to present each disease. The first component reviews the drugs and biologicals used to treat specific disease processes and emphasizes comparative features underlying the choice of agent (Pharmacodynamics and Pharmacokinetics). Chemical properties, such as solubility and stability, that determine the choice and use of the products, are discussed (Biomedical Chemistry and Pharmaceutics). The availability and comparative advantages of drug dosage formulations and delivery systems are considered as they relate to the optimum use of drug products during acute or chronic care (Biopharmaceutics).

The second component illustrates how the links between the scientific knowledge of the disease, available drug products, and the variables underlying a particular patient's condition are important to developing the most appropri-

ate therapeutic plan. Methods for the choice of drug products, definition of specific goals of therapy, including how to assess whether these goals are being achieved, and active intervention steps to ensure successful outcomes of drug therapy, are developed (Therapeutics). Methods for monitoring, identifying, and responding to untoward consequences of drug therapy are identified (Toxicology and Adverse Drug Reactions). The choice and design of specific acute and chronic drug therapy, the impact of a variety of patient-related variables on dosage regimens, and the modification of dosage regimens in response to changing patient needs are developed (Clinical Pharmacokinetics). Students develop skills as they practice counseling patients about their therapeutic plans in particular and providing health education in general (Counseling and Education).

The third component links the knowledge base of the first two components with appropriate ongoing methods for drug use review, medical audits, and cost considerations. The emphasis is on identifying specific interventions to improve prescribing patterns and reduce the cost of health care (Drug Use Evaluation).

Level V: Experiential Learning

Experiential learning is a series of structured learning and training activities during which students work under the supervision of experienced clinical and academic faculty in a variety of health care settings. Students obtain and apply knowledge and skills necessary for successful delivery of pharmaceutical care and develop competence, confidence, and maturity as responsible professionals. An innovative feature of the program is that experiential learning activities occur throughout the curriculum and are linked to didactic courses. A total of 33 credits in experiential courses (approximately 1,600 hours) are required for the Doctor of Pharmacy degree. All students must complete at least 24 credits (1,100 hours) of experience devoted to pharmaceutical patient care. Successful completion of the experiential learning portion of the School's curriculum is accepted by the Maryland Board of Pharmacy as meeting the internship requirements to sit for the NABPLEX licensure examination.

The Experiential Learning portion of the PharmD curriculum is organized into the six phases described below:

Phase I: Introduction to Professional Practice. This early practice experience introduces students to the professional responsibilities of pharmacists in a variety of practice environments, including community, hospital, and specialty settings. Students will also examine the spectrum of career opportunities available to today's pharmacist and begin developing basic practice skills.

Phase II: Longitudinal Pharmaceutical Care. During the second and third years of the curriculum, students observe and participate in the delivery of pharmaceutical care to patients. For each course, students follow the changing needs of a patient for one year within the context of the total health care system. Through direct patient encounters and discussion sessions, students learn to assess health status, communicate effectively, and determine pharmaceutical care needs from a holistic perspective. These activities are linked to material covered in the didactic curriculum.

Experiential Learning Map



Phase III: Safe Medication Order Processing. Activities during this phase develop students' competency and proficiency in the technical functions of drug dispensing and distribution in institutional and community pharmacy settings. Students learn to receive, interpret, and verify the appropriateness of prescription orders and to efficiently dispense a variety of manufactured and compounded medications. Emphasis is placed on communication, prevention of medication errors, the role of technology, and supervision of ancillary personnel in the medication order process.

Phase IV: Pharmaceutical Care. Students gain experience in the delivery of pharmaceutical care in a variety of practice environments, including community-based and acute-care hospital pharmacies, as well as ambulatory primary care and interdisciplinary clinics. Through daily encounters with patients and other health care providers, students learn to collect patient-specific data, identify and assess

drug-related problems, develop monitoring plans, and measure therapy outcomes. Further, students learn to educate patients and health care professionals regarding the appropriate use of drugs.

Phase V: Informational Services. Activities during this phase, which occurs simultaneously with Phase IV, require students to provide drug information in the context of delivering pharmaceutical care. Students learn to receive a question in a comprehensive fashion, thoroughly analyze and research questions, and provide appropriate answers to other health care providers and to patients and their families.

Phase VI: Elective Experiences. Elective rotations allow students to pursue their own areas of interest. Electives in general practice environments enable students to develop greater skill, proficiency, and confidence. Electives in specialty pharmacotherapeutic practice areas, alternative forms of advanced practice management, and research afford opportunities to explore a variety of practice options. This phase is linked to a senior colloquium.

Student's performance during all six phases is evaluated by both clinical and academic faculty. Experiential rotations are not permitted at sites where students are working for pay or where any other conflict of interest situation may exist.

Level VI: Curriculum Practice Interface

The sixth and final level of the curriculum contains a variety of educational experiences for students about to enter practice. Required and elective content areas provide the curricular-based interface with pharmacy practice that builds on the preceding didactic and experiential components of the curriculum. The *capstone* nature of this interface reflects the acquisition and appreciation of information that:

- is on the cutting edge of pharmacy practice,
- represents closing options for individual curricular pathways, or
- helps prepare students for a post-graduate education.

Students learning at the interface are expected to be under continual change and development. One goal of this level is to allow each senior student, following completion of his or her experiential components, time to consider an individual practice in the context of the total health care environment. An important part of this interface, therefore, is the opportunity for students to reflect interactively upon their educational experiences with fellow students, faculty members, and practitioners.

In the curriculum, students are trained to perform well at the patient level as well as the health system level. For example, on the patient level, students become active participants in the development of patient therapeutic plans. They select appropriate dosage forms, routes of administration, and dosage schedules. They prepare medications for patient use, counsel patients, maximize patient adherence to drug therapy, and assess therapeutic objectives. On the system level, students participate in medication-use process with other health care providers, assist patients in public health education programs, monitor pharmaco-economic and pharmaco-epidemiology issues in health care delivery, and participate in the formation of health policy.

CURRICULUM PATHWAYS AND ELECTIVES

The Doctor of Pharmacy curriculum encompasses educational experiences common to all students in the required components of the program. In addition, more than 21 percent of curricular time is reserved for didactic (20 credits) and experiential (8 credits) electives to provide students the flexibility to tailor individual plans to meet their career goals. Students develop an individual Plan of Study using courses offered at the School of Pharmacy, or at other University of Maryland System institutions, working in conjunction with academic advisors, preceptors, and other faculty. To assist students in designing their plan, the faculty has developed “curricular pathways” that organize electives in a logical sequence to better prepare students in particular areas of practice. In collaboration with their academic advisors, students use electives to develop a *Plan of Study* that is consistent with their personal interests and career goals. Student’s *Plan of Study* is used to enhance their general practice of pharmaceutical care, to focus on a particular area of practice, or to prepare for post-graduate studies.

Students may select freely from elective options to design their *Plan of Study* or may choose one of five model *pathways* designed to enhance their preparation for common areas of interest. The model pathways generally account for 16 to 18 of the 28 elective credits required for the degree. Therefore, students’ selection of a model pathway still provides them considerable flexibility in selection of additional electives.

Faculty pathway coordinators, who design and maintain the integrity of the pathways, and faculty advisors with expertise in each pathway area serve as consultants to students for information on career opportunities resulting from a particular pathway. Students have freedom of choice in selecting a pathway. Students, not choosing to take all courses in a specific pathway, can select elective courses from multiple pathways as part of their personal *Plan of Study*, provided they complete the appropriate prerequisites. Faculty have developed the following five model pathways:

ADVANCED PHARMACY PRACTICE

The goal of this pathway is to prepare students to implement pharmaceutical care in a variety of practice settings. This pathway provides a series of didactic and experiential courses designed to enhance competence in delivering pharmaceutical care in general practice and in delivering health care to special populations such as the elderly; to enhance knowledge of special pharmaceutical products, business and managerial skills needed to successfully deliver new services; and to provide experience in applying these professional and managerial skills in a variety of advanced practice settings.

GERIATRIC PHARMACY PRACTICE

This pathway is designed to prepare graduates to work with older individuals in a variety of practice settings or pursue advanced degrees (PhD, MPH) or training (fellowships, residencies) in the area of geriatrics or gerontology. By completing this pathway, graduates will learn essential principles to manage medication-related issues as well as understand the complexities in caring for the elderly. Outcomes are to develop a database of current students and graduates focusing in the area of geriatrics. Students selecting this pathway must complete 12 credits: the core 5 credits of didactic electives, 4 credits of other geriatric-focused electives or special projects, and 3 credits of geriatric-focused geriatric rotations.

MANAGEMENT

This pathway is designed to prepare students for management careers in corporate pharmacy, to develop entrepreneurial capabilities, and to prepare students for post-PharmD management residencies and/or MBA programs. Students take a series of didactic and experiential courses in personal management, practice management, organizational behavior, financial reporting and analysis, marketing, and working with managers in health care settings.

PHARMACOTHERAPY

The goal of this pathway is to enhance students' ability to independently optimize, implement, and monitor drug therapy in patients with complex health problems. This pathway offers a series of didactic seminar courses in pharmacotherapy and advanced therapeutics, coupled with advanced clinical experiences. The clinical experiences involve direct drug therapy management of patients in general medical and sub-specialty environments. Students completing this pathway are encouraged to pursue post-PharmD training in residencies and fellowships and to eventually pursue specialty board certification in pharmacotherapy.

RESEARCH

The goal of this pathway is to expose students to research and better prepare them for graduate studies or postgraduate fellowships. Students selecting this pathway take courses in advanced educational opportunities and advanced seminar courses in selected scientific areas. They receive research experiences, working directly with faculty scientists, and take a senior colloquium. Students are also encouraged to pursue the PharmD/PhD dual degree program (see the "PharmD Dual Degree Programs" section).

PHARMD PROGRAM SUMMARY

The faculty continue to revise the curriculum based on the dynamics of pharmacy education, the needs of practice, and the students. The exact nature of the curriculum may vary from class to class. The following describes the PharmD curriculum by semester.

COURSEWORK	MINIMUM SEMESTER CREDITS
Didactic	99 credits
79 Required	
20 Elective	
Experiential	33 credits
25 Required	
8 Elective	
TOTAL	132 credits

Coursework by Semester

The coursework by semester below outlines the required components of the curriculum. Electives can be taken during most fall, winter, spring, and summer semesters.

The total and minimum semester credits for didactic and experiential courses are listed in parentheses.

FALL FIRST YEAR COURSES

PHAR 510 Biochemistry	3 cr.
PHAR 513 Drug Chemistry	2 cr.
PHAR 514 Human Biology I	3 cr.
PHAR 516 Pharmacy Prac & Educ	2 cr.
PHAR 522 Context of Health Care	3 cr.
PHAR 523 Pharmaceutical Ethics	1 cr.
PHAR 526 Physical Chemistry	2 cr.
PHPC 510 Intro to Prof Practice I	1 cr.

TOTAL REQUIRED **17 (16/1)**

SPRING FIRST YEAR COURSES

PHAR 517 Study Design	2 cr.
PHAR 520 Molecular Biology	3 cr.
PHAR 524 Human Biology II	3 cr.
PHAR 531 Pharmaceutical Chem	2 cr.
PHAR 537 Principles Drug Action	2 cr.
PHPC 520 Intro to Prof Practice II	1 cr.

Total required **13 (12/1)**

FALL SECOND YEAR COURSES

PHAR 525 Immunology	2 cr.
PHAR 530 Micro/Antibiotics I	2 cr.
PHAR 532 Practice Management I	2 cr.
PHAR 533 Medicinal Chemistry I	1 cr.
PHAR 534 Human Biology III	3 cr.
PHAR 536 Pharmacology I	3 cr.
PHAR 541 Biopharmaceut/Kinetics	3 cr.

Total required **16 (16/0)**

Students will also register for June–Nov
Phase VI rotations

SPRING SECOND YEAR COURSES

PHAR 535 Pharmaceutics	3 cr.
PHAR 540 Micro/Antibiotics II	2 cr.
PHAR 542 Clinical Chemistry	1 cr.
PHAR 543 Medicinal Chemistry II	2 cr.
PHAR 544 Practice Management II	2 cr.
PHAR 546 Pharmacology II	3 cr.
PHPC 532 Longitudinal Care I	1 cr.

Total required **14 (13/1)**

Students will also register for Dec–May
Phase VI rotations

FALL THIRD YEAR COURSES		SPRING THIRD YEAR COURSES	
PHAR 552 Nutrition	1 cr.	PHAR 564 ISAT III	4 cr.
PHAR 553 Medical Info Analysis	2 cr.	PHAR 565 ISAT IV	4 cr.
PHAR 554 ISAT I	4 cr.	PHPC 562 Longitudinal Care II	1 cr.
PHAR 555 ISAT II	4 cr.		
Total required	11 (11/0)	Total required	9 (8/1)
Students will also register for <i>June–Nov</i> Phase III and Phase VI rotations		Students will also register for <i>Dec–May</i> Phase III and Phase VI rotations	

FALL FOURTH YEAR COURSES		SPRING FOURTH YEAR COURSES	
Students will register for <i>June–Nov</i> Phase III, IV, and VI rotations		Students will register for <i>Dec–May</i> Phase III, IV, V and VI rotations	
		PHAR 580 Pharmacy Law	2 cr.
		PHAR 581 Senior Colloquium	1 cr.
		Total required	3 (3/0)

Phase Descriptions

PHASE III ROTATIONS – 6 CREDITS	PHASE IV ROTATIONS – 13 CREDITS REQUIRED
PHPC 570 Med Process Community 3 cr.	PHPC 572 Community Pharm Care 3 cr.
PHPC 571 Med Process Institution 3 cr.	PHPC 573 Institution Pharm Care 3 cr.
	PHPC 574 General Pharm Care 3 cr.
	PHPC 576 Ambulatory Care 1 cr.
PHASE V ROTATION – 2 CREDITS	PHASE VI ELECTIVE ROTATIONS – 8 CREDITS MIN.
PHPC 577 Information Services 2 cr.	Various PHEX courses

NONTRADITIONAL PHARMD PATHWAY

The Nontraditional PharmD (NTPD) Pathway is offered for licensed pharmacists who have a Bachelor of Science in Pharmacy degree and seek to earn the Doctor of Pharmacy degree. The final applicants were admitted in Fall 2002. The School has implemented a phase-out plan for the final pathway graduation in May 2006. All graduates will be required to meet the terminal performance outcomes of the School's PharmD program, with at least 30 credits of coursework, which develops the knowledge, skills, and abilities for the delivery of pharmaceutical care. Credits in the NTPD Pathway may be earned by taking courses from a faculty-approved plan of study, through supervised experiential learning, and by approved self-study or electives with appropriate assessment.

EXPERIENTIAL LEARNING

Experiential learning will be centered in the pharmacist's own practice site, under the supervision of a faculty mentor; one credit of clerkship experience is required at other sites. The faculty mentor will work closely with each pharmacist to identify an appropriate mix of his or her own patients and to develop an experience component that will meet individual needs, satisfy pathway requirements, and benefit patients. Beginning with the initial patient identified as a study case, students will learn to triage, develop explicit pharmaceutical care plans, and initiate the patient management process. To monitor progress and provide feedback to students, faculty mentors will use performance-based evaluation. For more information, students may call 410-706-0761.

PHARMD DUAL DEGREE PROGRAMS

The School offers three dual degree programs for PharmD students who are interested in gaining specialized expertise in law, business administration, or research. Students apply to these programs in the second year of the PharmD program. The dual degree programs have separate admission requirements. The programs are briefly described below:

PHARMD/JD PROGRAM

The School offers a dual Doctor of Pharmacy/Juris Doctor degree program with the University of Maryland School of Law for students who wish to pursue the Juris Doctor. The PharmD/JD program allows students to gain the requisite knowledge in legal skills in a variety of areas. Graduates of this program will be prepared for careers in a diverse range of health care and legal areas. PharmD students can use 16 credit hours obtained from the law curriculum to fulfill their 20 hours of didactic pharmacy electives. Students could complete the dual degree program in six years.

PharmD students must apply to the JD program and meet all admissions criteria, including submitting results of the LSAT, and adhere to the School of Law's procedures and deadlines. Admission is not guaranteed. For more information about the JD program, contact the School of Law at 410-706-3492 or e-mail admissions@law.umaryland.edu.

PHARMD/MBA PROGRAM

The School offers a dual Doctor of Pharmacy/Master of Business Administration program with the University of Baltimore Merrick School of Business for students who wish to pursue the Master of Business Administration degree. The PharmD/MBA program allows pharmacy students to take MBA courses as part

of their PharmD curriculum. While in pharmacy school, PharmD students may complete 20 of the 48 credit hours required in the MBA program.

PharmD students must apply to the MBA program; admission is not guaranteed. Students wishing to apply to the MBA program must adhere to University of Baltimore (UB) procedures and deadlines. Students must also request that the University of Maryland's Office of Records and Registration send their official University of Maryland transcript and that the School of Pharmacy Office of Student Affairs send a copy of their prepharmacy transcripts to UB. Students applying to this dual program need the equivalent of a bachelor's degree (i.e., either a degree or completion of four years of college). The grade point average for an entering MBA student is 3.0; however, a lower GPA may be offset by a higher score on a standardized test (e.g., GMAT, PCAT). For more information about MBA program, contact the Advising Center at the University of Baltimore at 410-837-4944. For information about the admissions process, contact the Office of Graduate Admissions at 410-APPLYUB.

PHARMD/PHD PROGRAM

The School offers dual Doctor of Pharmacy/Doctor of Philosophy programs in Pharmaceutical Sciences and Pharmaceutical Health Services Research to prepare comprehensively trained individuals with an interdisciplinary perspective on teaching and scientific research. The PharmD/PhD program is a cooperative effort between the PharmD curriculum and the graduate curricula of the Department of Pharmaceutical Sciences and the Department of Pharmaceutical Health Services Research. The PharmD and PhD phases of the program run concurrently with minimal disruption of the academic content or sequencing of the PharmD component. This permits dual degree students to progress normally in the PharmD program and graduate with their class. To achieve this goal, students may take open vacation periods as well as Research Pathway electives and other elective options within the PharmD program and apply them toward meeting the requirements of the PhD degree. Students already in the PharmD program may be considered for admission to the dual degree program. Dual degree students can expect to complete their core graduate coursework and be ready for advancement to candidacy for the PhD degree by the time they complete the PharmD program. Students may complete the requirements for the award of both the PharmD and PhD degrees in six or seven years.

Consideration for admission to the PhD degree program is contingent upon satisfying the admission requirements of the University of Maryland Graduate School. A bachelor's degree is generally required for admission to the graduate program. Applicants to the PhD programs will be evaluated on the following criteria: the quality of the academic record, standardized test scores (GRE scores of 1600 or better, PCAT scores, and where applicable, TOEFL scores of at least 600), letters of recommendation, interviews, compatibility between the students' career goals and the objectives of the PhD program, and a GPA of 3.0 or better.

For more information about admissions to the PhD programs, contact the following departments: Department of Pharmaceutical Health Services Research call 410-706-7613 or e-mail phsr@rx.umaryland.edu. The Department of Pharmaceutical Sciences, call 410-706-0549 or e-mail pscprog@rx.umaryland.edu.

LICENSURE REQUIREMENTS

Students who complete the PharmD degree satisfy the educational requirement for all state boards of pharmacy in the United States. Graduates are eligible to take state licensing exams in all states. For more information about licensure as a pharmacist in Maryland, graduates may contact the Maryland Board of Pharmacy at 4201 Patterson Ave., Baltimore, MD 21215-2299, call 410-764-4755, or E-mail: mbop@dhmh.state.md.us.

International pharmacists who have received their pharmacy degrees from non-US institutions have two options to become licensed pharmacists in the United States. They can apply to the PharmD Program (see the International Pharmacist Applicants section of this catalog) or complete the Foreign Pharmacists Equivalency Examination, which certifies the applicant for the board examination. Individuals taking this approach would not need to attend the School of Pharmacy. For more information, write or call the National Association of Boards of Pharmacy Foundation, Foreign Pharmacy Graduate Examination Committee, 700 Busse Highway, Park Ridge, IL 60068, 847-698-6227.



Pharmacy Practice Lab director Fred Abramson and student Mariel Sinkov review a prescription.

Doctor of Philosophy Programs

Applicants seeking advanced degrees, MS and PhD, in pharmaceutical sciences or pharmaceutical health services research must apply to the University's Graduate School departments. Interested applicants also should review the Graduate School catalog for more specific information about the MS and PhD programs. The PhD programs in pharmaceutical health services research and pharmaceutical sciences are described as follows. Interested applicants may apply online at <http://graduate.umaryland.edu/admissions.html> or, if necessary, obtain an application form from the department to which they are applying.

Opportunities are available for postgraduate study: residencies, postdoctoral fellowships, and other professional studies. Contact the department for specific information.

PHARMACEUTICAL HEALTH SERVICES RESEARCH PHD PROGRAM DESCRIPTION

The graduate program in Pharmaceutical Health Services Research seeks to train scholars and researchers in one of four major research areas: pharmacoeconomics, pharmacoepidemiology, behavioral sciences, or pharmaceutical policy as it relates to the delivery, use, costs, and safety of pharmaceuticals and other health care products. Each student is required to select one research area or track of specialization in which they will take advanced courses and conduct their dissertation research.

Graduates of the program will receive training to: 1) design and carry out pharmaceutical health services research based on strong training in research methodologies, statistics, one or more pharmacy specialty areas, and a sound understanding of the U.S. health care system; 2) serve as a knowledgeable spokesperson to the public and private sectors of health care concerning pharmaceutical health services research, practice research, and pharmacy-related policy issues; 3) interact with members of other health, social, and administrative disciplines and initiate and/or collaborate in research endeavors related to pharmaceuticals and other health services; and 4) be an effective teacher both in academic and nonacademic settings.

PHARMACEUTICAL HEALTH SERVICES RESEARCH PROGRAM OVERVIEW

The PhD graduate program in Pharmaceutical Health Services Research offers advanced training by faculty who are regional, national, and international leaders in the fields of pharmacoeconomics, pharmacoepidemiology, pharmaceutical policy, and the behavioral sciences. The specialized curriculum, with an emphasis on developing research skills, trains students for leadership roles in academia, government, industry, and consulting.

ADMISSIONS INFORMATION

Applicants to the Doctor of Philosophy in Pharmaceutical Health Services Research should possess a bachelor's or master's degree from an accredited college or university. Applicants without a Bachelor of Science in pharmacy or a Doctor of Pharmacy degree will be considered, but, in general, preference will be given to candidates with previous pharmacy-related education and/or experience.

Applicants must satisfy the general requirements of the University's Graduate School before consideration for admission to the program. The minimum standard for admission to the Graduate School is a B average, or 3.0 on a 4.0 scale, in a program of study resulting in the award of a baccalaureate degree from an accredited college or university.

APPLICATION PROCEDURE

Applications to the graduate program in Pharmaceutical Health Services Research should be directed to the following address: Graduate School, University of Maryland, 621 W. Lombard St., Room 336, Baltimore, MD 21201; 410-706-7131. An online application is available at http://graduate.umaryland.edu/adm_appinfo.htm. The following forms and/or documents are required for processing of an application by the Graduate School:

- Application for admission (three copies)
- Official transcripts (two copies)
- Letters of recommendation (three letters)
- Results of the Graduate Record Exam
- Processing fees for international students
- TOEFL scores
- Statement of financial status
- Immigration documents (form I-20)

Officially, applications must be received by the Graduate School by July 1 for the fall semester, December 1 for the spring semester, and by May 15 for admission to the summer semester. However, it is preferred that applications be received by January 15 for the fall semester. Applicants interested in receiving a teaching assistantship or research assistantship must apply by March 1. An international student application must be received six months prior to the semester of expected entrance. Contact the department for more information: Pharmacy Administration Graduate Program, School of Pharmacy, University of Maryland, 515 West Lombard Street, Second Floor, Baltimore, MD 21201-1180.

1. In addition to official transcripts and three letters of recommendation as evidence of academic potential, the student is to submit scores from the Graduate Record Examination. Graduate Record Examination scores are used as part of the date on which admission decisions are based, but are seldom the sole criteria for admission.
2. Applicants with completed applications are encouraged to arrange an interview with the Department. A limited number of students who fail to meet these minimum standards may be admitted to graduate study as

provisional students on the basis of outstanding performance on the Graduate Record Examination and on the basis of letters of recommendation from competent judges of their performance as students or of their professional capacity. Provisional admissions carry explicit conditions (e.g., minimal grade requirements in stipulated courses) that must be met before the student can be advanced to full graduate status. Specific conditions for admission as a provisional graduate student may be found in the current edition of the Graduate School Catalog.

ACADEMIC PROGRAM REQUIREMENTS

The minimum requirements for a student to receive a doctoral degree in the Pharmaceutical Health Services Research Graduate Program are detailed below. Individual students might be required to take additional courses as deemed appropriate by their curriculum committee. In particular, students without strong computer programming skills may need elective courses.

Required courses include a group of core graduate courses in pharmacoepidemiology, pharmacoconomics, pharmaceutical policy, and the social and behavioral sciences, in addition to research methods, and statistics. Students must complete at least 12 credits of advanced courses in their research track beyond any core courses. It generally takes two to two-and-a-half years to complete the course requirements.

Although many students come to the program with prior graduate work, the department requires that they take the core courses here. When non-core courses or the beginning/intermediate statistics requirements are waived, students are expected to take other advanced courses to complete the course requirements. To allow flexibility and to ensure that students are well prepared in their area of specialization, each student is asked to establish a curriculum committee by the end of their first semester of study.

The following outlines the required core course curriculum for this program:

Core Course Curriculum (33 Credits)

COURSES	CREDITS
PHSR 610—Health Care System	3
PHSR 620—Social Behavioral	3
PHSR 650—Pharmaceutical Econ	3
PHSR 670—Health Education	3
PHSR 704—Pharmacopeia	3
PHSR 701—Research Methods I	3
PHSR 702—Research Methods II	3
PREV 600—Intro to Epidemiology	3

continues

COURSES	CREDITS
Statistics	9
PHSR 709—Seminar*	3
Advanced Cognate	
Coursework	12
PHSR 899—Dissertation	12

*Graduate seminar is conducted weekly to inform students and faculty about new research and current issues. Seminar attendance is mandatory for all graduate students while in residency. Additionally, students must register for seminar credit in three separate seminars. Students receive one credit for successfully preparing and delivering a seminar on an ongoing research project or research proposal under the direction of a faculty member. Each student must have at least one seminar credit prior to taking his or her general comprehensive examination. Furthermore, students must present their dissertation research at least once in a graduate seminar.

Comprehensive Examination

The purpose of the comprehensive examination is to test students' depth and breadth of knowledge in the field of pharmaceutical health services research: theory, methods, statistics, and their chosen area of specialization. Students are expected to be fluent in research techniques, current developments, general research methods, study designs, statistical methods, and their professional and ethical responsibilities. Students should not only know the basic concepts, but also be able to interpret and apply them under various scenarios.

Dissertation

The dissertation is the product of intensive research at the doctoral level, distinguished by its deeper, more comprehensive, professional and scholarly treatment of the subject. The doctoral dissertation is expected to represent independent and original research in the field of the candidate's graduate study. It must add to understanding in the candidate's field. The project must be of sufficient difficulty and depth to test the candidate's ability to carry out research independently, and it should show a mastery of the skills needed for such research.

Oral Defense of Dissertation Proposal

Students must submit the proposal to the dissertation committee for review and comment. The student, in consultation with the research advisor, will schedule the oral examination to defend the research proposal.

Final Oral Exam Defense

After completing the dissertation, the candidate must defend it before the academic community. The defense is open to all members of the University graduate faculty. Regulations governing the style, format, and how to submit the dissertation for publication may be obtained from the Graduate School.

Additional Activities

- Teaching experience is required during the first year. Doctoral students in pharmaceutical health services research are expected to participate as fully as possible in opportunities to develop their teaching skills.
- Experiential learning is required of all students. In general, a student does not receive additional credit for experiential learning, but it is a significant part of the program.
- Participating in professional meetings and organizations is recommended. Students are encouraged to submit papers to local, regional, and national professional meetings.

FINANCIAL SUPPORT

Financial support is available to students accepted into the program: graduate research assistantships funded by the Graduate School, graduate research assistantships funded by faculty-sponsored projects, and graduate teaching assistantships.

PHARMACEUTICAL SCIENCES PHD PROGRAM OVERVIEW

Graduate students, staff, and faculty are pursuing a wide range of pharmaceutical research, such as biotechnology-related pharmaceutical science research involving molecular biology; macromolecular structure, dynamics and drug design; pharmacology and neuroscience; and novel drug and gene delivery. Pharmaceutical sciences is the largest graduate program on campus and perhaps the largest of its type in the United States. This critical mass of graduate students working with over 30 faculty and staff members, provides a stimulating environment for the pharmaceutical sciences graduate student.

Components of our multidisciplinary program include the following three informal Research Pathways: Cellular & Biological Chemistry, Pharmacology & Neuroscience, and Biopharmaceutics & Drug Delivery Technology. The mission of each Research Pathway is to foster individual and collaborative research, faculty growth, and a graduate student education which provides a strong, broad background in the drug development process along with intensive expertise in a focal research area of the pharmaceutical sciences. For more complete description of the graduate program, see www.pharmacy.umaryland.edu/graduate/psc.

PHARMACEUTICAL SCIENCES DEPARTMENT OVERVIEW

The Department of Pharmaceutical Sciences is involved in understanding the underlying biology of disease, mechanisms of drug action, drug design, and drug product design and evaluation. The Department of Pharmaceutical Sciences is, by its nature, a multidisciplinary environment. Disciplines covered include cell, molecular and structural biology; organic chemistry to computer-aided rational drug design, comprising the core of the drug discovery/drug design and the struc-

tural biology initiative; pharmacology and neuroscience, including molecular, biochemical, and behavioral approaches probing pharmacodynamic questions in carcinogenesis, respiratory biology, drug addiction, Parkinson's Disease and other neurodegenerative diseases, schizophrenia and other psychiatric diseases, and epilepsy; and pharmacokinetics, drug transport, industrial pharmaceutical research, and novel drug/gene delivery.

Pharmaceutical sciences contribute to the discovery, design, and development of drugs. Drug discovery and development is a dynamic process, requiring integrated efforts across classical scientific disciplines. Hence, the graduate program in pharmaceutical sciences uniquely prepares graduates for mankind's greatest intellectual and practical challenge: to discover medicines to discover medicines and to delivery them to patients.

ADMISSIONS INFORMATION

Admission to the graduate program is contingent upon satisfying the admission requirements of the Graduate School. In most instances, candidates for admission who have earned a BA or BS degree in chemistry, biology, biochemistry, psychology, chemical engineering, or in pharmaceutical science possess adequate preparation for the graduate program.

A completed Application Form, official test scores (not copies), official transcripts, and other supporting documentation are required. Completed applications received before January 15 will be notified of our decision in early February, and will be preferentially processed over later applications. Selected applicants may be invited for a personal interview and tour of the campus and facilities. Applications are accepted for Fall Only.

Applications for admission to the graduate program are evaluated on the basis of the following:

- Quality of academic performance
- Graduate Record Examination (GRE) scores
- TOEFL or IELTS scores (for international applicants)
- Three (3) letters of recommendation (mailed to the Department of Pharmaceutical Sciences)
- A "Statement of Academic Goals and Research Interests" that is compatible with faculty research projects (mailed to the Dept. of Pharmaceutical Sciences)

The (GRE) General Test scores must be submitted as part of the admissions process. International students must obtain at least a score of 600 in the TOEFL Examination or 7.0 in the IELTS.

APPLICATION PROCEDURE

Applicants for the PhD in Pharmaceutical Sciences must send certain materials to the University of Maryland Graduate School, while other materials must be sent to the Department of Pharmaceutical Sciences. Applicants may review admis-

sions procedures and requirements of the University of Maryland's Graduate School on the Web site or e-mail gradinfo@umaryland.edu or call 410-706-7131 for more information. Applicants must submit the list of materials which follows to the University's Graduate School at: Graduate Admissions and Enrollment Services, Baltimore Student Union, Room 336, The Graduate School, University of Maryland, Baltimore, MD 21201-1550.

- Submit one set of official Graduate Record Examination (GRE) General Test scores (not a copy) and two sets of official Test of English as a Foreign Language score (if international applicant) with a minimum score of 600 and/or have taken conversational and written English coursework.
- Submit two sets of official transcripts or mark sheets.
- Submit the required nonrefundable application fee. Make check payable to: University of Maryland.

Applicants must **also** submit the following to the School of Pharmacy Department of Pharmaceutical Sciences at: Pharmaceutical Sciences Graduate Program, School of Pharmacy, University of Maryland, 20 N. Pine St., 4th Floor, Baltimore, MD 21201-1180.

- Submit a *Statement of Academic Goals and Research Interests*. In your "Statement of Academic Goals and Research Interests," please discuss concisely your academic objectives pertaining to the pharmaceutical sciences and your professional career goals. Include a description of relevant work experience as appropriate. To facilitate review of your application, please denote a research pathway (see Programs) at the top of your Statement.
- Submit three (3) letters of recommendation. A form is available from www.pharmacy.umaryland.edu/Admissions/recommend.pdf.

International Students

International students should not plan on leaving their country before obtaining official notification of admission to the graduate program from the director of graduate admissions and an I-20 form from the Office Records and Registration. The following rules apply:

- Sufficient funds must be available to support the student for one year. Students may obtain the immigration form (I-20) necessary for obtaining the appropriate visa from the University's Office of Records and Registration.
- Students already studying in the United States who wish to transfer to the University of Maryland must also secure proper immigration documents in order to request that the Immigration and Naturalization Service grant permission to transfer to the University of Maryland.
- Every international student must report to the Office of Records and Registration as soon as possible after arriving at the University.
- Students from non-English-speaking countries are considered for admission only if they have received a total Test of English as a Foreign Language (TOEFL) score of 600 (250 on the computer-based score). Because TOEFL is given only four times a year throughout various parts of the world, it is necessary for the applicant to make arrange-

ments with the Educational Testing Service, Box 899, Princeton, NJ 08540, to take the test as soon as study at the University of Maryland is contemplated.

- Graduate students whose work indicates English language deficiencies will be required to take remedial English courses.

PHARMACEUTICAL SCIENCES PHD PROGRAM DESCRIPTION

The goal of the Department of Pharmaceutical Sciences graduate program is to prepare independent, creative scientists to function well in academia, the pharmaceutical industry, and in government or other research institutions. The pharmaceutical sciences graduate program is administered through the Graduate School (www.graduate.umaryland.edu).

ACADEMIC PROGRAM REQUIREMENTS

The graduate program is “mentor-driven” – a plan of study is individualized and dependent on the student’s and mentor’s specific research interests. Each student develops their educational experience with the advice of his/her mentor and an Advisory/Thesis Committee. The awarding of the degree is contingent on the candidate’s successful defense of a dissertation based on independent original research. Graduates will be educated with the knowledge and skills to direct the discovery, development and delivery of medications for safe and effective therapy. Departmental course offerings are described in detail in the “Program Course Descriptions” section of this catalog.

A student typically graduates after five years in the PhD program. In the first two years, students focus on completing classroom requirements and initial dissertation research. Early in the third year, students take the comprehensive examination, where each student proposes dissertation research and defends the proposal orally and in writing. In the last three years, students focus on laboratory experimentation and the presentation of a dissertation.

The minimum course requirements of the PhD degree program are as follows:

Core Course Curriculum

COURSE	CREDITS
PHAR 600 and 601—Pharmaceutical Drug Design and Development	3 each
PHAR 608—First-Year Rotations	1
PHAR 708—First-Year Seminar	1
Two techniques courses	4 minimum
Ethics course (e.g., DOCB 605—Scientific Method, CIPP 909—Responsible Conduct of Science)	
Minimum three additional courses	
Three seminar presentations	3
PHAR 899—Thesis Research	12

FACULTY RESEARCH AREAS

- Larry L. Augsburger, pharmaceuticals; solid oral dosage form design
- Adrian H. Bachelor, X-ray crystallography
- Gary G. Buterbaugh, pharmacology of epileptic seizures
- Andrew Coop, organic and medicinal chemistry; opioid and sigma receptors
- Richard N. Dalby, respiratory drug delivery; metered dose inhalers (MDIs); dry powdered inhalers (DPI); nebulizers
- Russell J. DiGate, genetics; DNA topoisomerase III
- Natalie D. Eddington, pharmacokinetics; brain delivery; pharmacodynamic relationships
- Hamid Ghandehari, controlled drug delivery; polymers; biomaterials
- Ronald D. Guiles, protein structure, including Heme and human interleukin-5; nuclear magnetic resonance
- Jun Hayashi, cell biology; lymphocyte signal transduction
- Stephen W. Hoag, pharmaceuticals; controlled release tablets; power technology
- R. Gary Hollenbeck, physical pharmacy; novel drug delivery systems
- Kwang Chul Kim, cell biology; epithelial cell surface mucins (MUC1 mucins)
- Alexander D. MacKerell Jr., computational chemistry; novel inhibitors of HIV integrase
- J. Edward Moreton, pharmacology; behavioral and neuropharmacological aspects of drug abuse
- James E. Polli, oral biopharmaceuticals; bioavailability; intestinal permeability
- Gerald M. Rosen, free radicals in biological systems; host immune response
- Paul S. Shapiro, signal transduction; mitogen-activated protein (MAP) kinase pathways
- Rakesh K. Srivastava, cell growth; differentiation and apoptosis; Bcl-2 family members
- Peter Swaan, cell biology; computational chemistry; drug bioavailability; drug delivery
- Ashiwel S. Undie, signal transduction; phospholipase C-dependent signal transduction; dopamine
- Jia Bei Wang, neurotransmitter receptors; mu opiate receptor
- Myron Weiner, drug metabolism; cytochrome P450; hepatocytes
- Angela Wilks, protein structure and function: heme proteins; *Shigella dysenteriae*

ACADEMIC RESOURCES

Extramural funding for research is currently almost five million dollars and ongoing investigations include collaborative projects with other researchers on campus and at the FDA, NIH, Johns Hopkins University, Walter Reed Army Institute of Research, and the pharmaceutical industry. Projects include biotechnology-related pharmaceutical science research involving molecular biology; macromolecular structure, dynamics and drug design; pharmacology and neuroscience; and novel drug and gene delivery.

The Department of Pharmaceutical Sciences has one of the most modern industrial and pharmaceutical technology research and manufacturing facilities in the country. It has small-scale and pilot-scale equipment for the production of aerosols, parenterals, liquid, semi-solid, and solid dosage forms. There is a state-of-the art analytical facility for basic and applied pharmacokinetic research and clinical research in hospitalized patients. The laboratory is equipped to investigate all phases of drug absorption and disposition in animals and/or humans. A Good Manufacturing Practice facility exists for small-scale manufacturing pharmaceuticals.

FINANCIAL SUPPORT

Financial support is available to students accepted into the program, such that students can focus on graduate studies. Support includes a stipend (currently \$19,000 for year 2003 for Step I pre-candidates and \$20,000 for Step II candidates), tuition, health, and fees. Additional merit awards are given to the department's most outstanding students.

Competitive departmental fellowships are awarded by the department each year: Dunning Fellowship, Emerson Fellowship, Slama Graduate Award, and the Shangraw/Center for Professional Advancement Scholarship. Additionally, many students each year earn external fellowships, through excellence in academics and research.

GRADUATE STUDENT ORGANIZATIONS

Graduate students play a particularly active role in a number of campus student organizations. Additionally, two graduate student organizations within the School of Pharmacy and the Department of Pharmaceutical Sciences are the Pharmacy Graduate Student Association and a student chapter of the American Association of Pharmaceutical Sciences. Moreover, depending upon their specific research interests, individual students often join national professional societies, many of which host meetings and workshops in the mid-Atlantic region.



Pharmacy students discuss group project.

Financial Information

The School's tuition and fees, health insurance, residency status, and financial aid information is as follows:

TUITION AND FEES

The following lists the tuition and fees for the 2003–2004 academic year. The tuition per credit hour rate below is for the Nontraditional PharmD Pathway and graduate programs only. Students in these programs are charged this rate regardless of the number of credit hours they take.

TUITION	FULL-TIME	NTPD	GRADUATE
Full time (9 or more credits)			
Resident	\$ 9,773		
Nonresident	\$20,444		
Per credit hour rate			
Resident		\$380	\$314
Nonresident		\$694	\$562
Fees			
Techology	\$ 60	\$ 10	\$ 10
Student Government Association	\$ 15	\$ 15	\$ 15
Transportation	\$ 28	\$ 28	\$ 28
Student activities	\$ 54	\$ 54	\$ 46
Supporting facilities	\$ 425	\$351	\$351
Other Expenses			
Clinical clerkship (experiential courses)	\$ 315	\$315	
Supplemental Application fee	\$ 20		\$ 50
Admission acceptance deposit (nonrefundable)	\$ 800		
Late registration fee	\$ 40	\$ 40	\$ 40
Diploma fee	\$ 55	\$ 55	\$110
Liability insurance	\$ 22	\$ 22	
Disability insurance	\$ 21		
Hepatitis B vaccine (1st year only)	\$ 105		
Continuing education certification	\$ 100		
Late payment of tuition and fees*	\$ 100	\$100	\$100

*Late payment of tuition and fees is \$100 or 5% of the balance, whichever is less.

NOTE: Notwithstanding any other provision of this or any other University publication, the University reserves the right to make changes in tuition, fees and other charges at any time such changes are deemed necessary by the University and the University System of Maryland Board of Regents.

HEALTH INSURANCE

University or equivalent health insurance coverage is required of all full-time students. Students will be billed for health insurance unless they provide proof of similar coverage to the Office of Student and Employee Health. If students provide documentation, the cost of the premium is waived. The cost of health insurance varies depending on the type of coverage. For information about health insurance, call Student Accounting at 410-706-2930 or visit their office in the Administration Building, Room 313. Details are also online at www.umaryland.edu/health/.

DETERMINATION OF IN-STATE RESIDENCY

The Office of Records and Registration makes an initial determination of residency status for admission and tuition when students apply for admission. The determination made at that time, and any determination made thereafter, shall prevail for each semester until the student changes the status. Students classified as in-state residents are responsible for notifying the Office of Records and Registration in writing within 15 days of any change in their circumstances which might in any way affect their classification at the University. Students may obtain a copy of the University's policy on in-state residency status from the office listed above.

PHARMD STUDENT FINANCIAL AID

The Office of Student Financial Aid centrally administers student financial aid programs. These programs are designed to help students who otherwise would be unable to attend the University. Aid packages for students often include a combination of loans, grants, scholarships, and work-study designed to meet students' needs. To qualify for aid, students must apply annually and meet the eligibility requirements. Also, **students must complete the required financial aid application forms and are encouraged to do so by February 15**. For more information about financial aid and to obtain application forms, call 410-706-7347, visit the Web site: www.umaryland.edu/fin/, or write to: Student Financial Aid, University of Maryland, Baltimore Student Union, Room 334, 621 W. Lombard St., Baltimore, MD 21201.

SCHOOL OF PHARMACY SCHOLARSHIPS

Through the generous gifts of alumni, friends, and professional associations, the School provides additional financial aid to its full-time students who are in need of financial support. Students do not apply for these awards. Students who receive most awards are those who can document unmet financial need through the student financial aid process. Some scholarships support students from certain geographical areas. The School has established the following scholarships:

April Adams Memorial Scholarship. The students, faculty, and friends of April Adams established this scholarship as a lasting tribute to Adams, Class of 1999. The scholarship, symbolizing her dedication and love of pharmacy, will be awarded to deserving students in her name.

Marilyn I. Arkin Scholarship Fund. The family and friends of Marilyn I. Arkin, daughter of Ann and Morris Arkin and a member of the Class of 1975, established this scholarship as a memorial in 1988. The scholarship provides support for professional students in the School of Pharmacy.

The Yvette Beakes Memorial Scholarship. Family, friends, classmates and faculty established this scholarship in June 2002 as a memorial to Yvette Beakes, Class of 2000 PharmD graduate. The scholarship provides support for financially needy professional students who have made contributions to community or health care causes.

Caspari Memorial Fund. Alumni and friends of Professor Charles Caspari, Jr., former dean of the School of Pharmacy, established this scholarship November 25, 1917, to support a deserving student who has financial need.

Centennial Research Fund. This fund was established September 13, 1946, with contributions from the Centennial Research Fund campaign launched in 1941 to commemorate the 100th anniversary of the School of Pharmacy. The students who receive this fellowship do research in the following fields: pharmacy, pharmaceutical chemistry, pharmacology, microbiology, and pharmacognosy.

H.J. (Jack) Custis, Jr., Memorial Scholarship Fund. In memory of H.J. (Jack) Custis, Jr., Class of 1951, a fund was established to award scholarships on the basis of reasonable need and academic ability to students in the professional program of the School of Pharmacy. Students must be residents of one of Maryland's nine Eastern Shore counties to be eligible for the Custis Memorial Scholarship.

H.A.B. Dunning Fellowship Fund. This fund was first established from annual donations beginning in 1930 and endowed in 1963 by bequest to the School of Pharmacy from Dr. H.A.B. Dunning, distinguished alumnus of the School and prominent Baltimore manufacturing pharmacist. This fellowship is open to promising graduate students doing research in pharmaceutical chemistry.

Isadore M. and Irene R. Fischer Memorial Scholarship Fund. The families of Isadore M. and Irene R. Fischer have provided a scholarship fund to support a professional or graduate student demonstrating academic excellence in the educational programs of the University of Maryland School of Pharmacy.

Charles L. Henry Memorial Scholarship Fund. The Charles L. Henry Memorial Scholarship Fund has been provided for PharmD students in the School of Pharmacy requiring financial assistance.

L. Louis and Elinor Hens Memorial Scholarship Fund. Established in 1990 by Mrs. Elinor Hens in memory of her husband, this fund is used to support deserving students who have financial need.

Dr. Paul Jablon Research Award. Mr. Leon Jablon and the late Mrs. Yetta Jablon established this award in January 1985 in memory of their son, Dr. Paul Jablon. The research award is given to students displaying exceptional promise in the field of pharmaceuticals.

J. Gilbert Joseph Scholarship. In memory of her brother, J. Gilbert Joseph, a former student of the School of Pharmacy, the late Miss Jeanette Joseph pro-

vided a generous bequest to endow scholarships to be awarded to qualified students who have maintained a superior scholastic average and who are in need of financial assistance.

Frederick William Koenig Memorial Scholarship. In memory of her husband, Frederick William Koenig, a practicing pharmacist for 50 years, the late Mrs. Valeria R. Koenig has bequeathed a sum of money to endow a scholarship to be awarded annually. The recipient of the award will be selected on the basis of financial need, character, and scholarship.

The Bernard Lachman Memorial Scholarship Fund. The family, friends, and colleagues of Bernard Lachman established this fund in 1999 in his memory. The scholarship is used to support students who have financial need.

Dr. Dean E. Leavitt Memorial Scholarship Fund. In honor of Dr. Dean E. Leavitt, associate dean for administration and professional services, 1976–1989, the family and the faculty established a fund to support a scholarship covering the final year of pharmacy school for students who have attained at least a cumulative average of 3.0, who have shown superior aptitude and enthusiasm in the course sequence in management, and who have demonstrated, as Dean Leavitt did, a commitment to the qualities of health and humanitarianism, both personally and professionally.

A.M. Lichtenstein Scholarship. In memory of her husband, A.M. Lichtenstein, distinguished alumnus of the School of Pharmacy, Class of 1889, the late Mrs. Francina Freese Lichtenstein bequeathed a sum of money to endow an annual scholarship to a resident of Allegheny County, Md. The recipient of the award is to be selected on the basis of financial need, character, and scholarship.

The Dr. L. Lavan Manchey Scholarship Fund. This fund was established July 8, 1997, in memory of L. Lavan Manchey, PhD, Class of 1926, and winner of the Simon Gold Medal for proficiency in practical chemistry in 1928. The scholarship is used to support students who have financial need.

Aaron and Rosalie Paulson Scholarship Fund. Established by Mr. Aaron A. Paulson, Class of 1924, and his late wife, Rosalie, this endowed scholarship supports a first professional year student with demonstrated financial need.

Plough Pharmacy Student Scholarships. The Plough Foundation, created by Abe Plough, founder of Plough Inc., and the School of Pharmacy contributed funds to an endowment that provides financial support to pharmacy students. The funds are awarded on the basis of financial need, academic achievement, leadership, and citizenship.

Leonard Rodman Dean's Scholarship Fund. Established in March 2001 by Mr. Leonard Rodman, this fund is used to provide scholarship to support students who have financial need.

Milton C. And Elizabeth C. Sappe Scholarship Fund (Formerly the Milton Charles Sappe Scholarship Fund). Elizabeth Sappe established this scholarship in December 1995. The scholarship is used to support students who have demonstrated financial need, high academic standing, and are residents of Maryland.

Joseph Sokol Memorial Scholarship. In memory of Joseph Sokol, Class of 1973, his family and friends established this scholarship to provide support for deserving students who have financial need.

Arthur Schwartz Memorial Scholarship Fund. The family and friends of Arthur Schwartz, BS Pharm 1979, PhD Pharmacy Administration 1987, have established an endowed scholarship fund for a graduate student in Pharmacy Administration to honor his memory.

Dr. Frank J. Slama Fellowship Fund. Established in April 1996 from the estate of Lillian Slama, in memory of her husband, Dr. Frank J. Slama, this fellowship supports one or more annual award(s) for graduate students studying medicinal chemistry and/or pharmacognosy.

LOAN FUNDS

Students in financial need may apply for the School loans described below. For more information, contact the associate dean for student affairs.

Rose Hendler Memorial Fund. L. Manuel Hendler and family have established a loan fund in memory of Mrs. Rose Hendler for needy students. Loans from this fund are available to qualified students.

Louis T. Sabatino Memorial Student Loan Fund. In honor and memory of her late brother, Louis T. Sabatino, Class of 1939, Mrs. Marie Sabatino DeOms has established this fund to provide loans to deserving students.

Benjamin Schoenfeld Memorial Pharmacy Loan Fund. The family of Mr. Benjamin Schoenfeld, Class of 1924, has established a loan fund as a memorial to him. This fund is available to qualified needy students. Loans are made upon the recommendation of the dean.

Burroughs-Wellcome Emergency Loan Fund. The Burroughs-Wellcome Co. established a fund to provide short-term (two months) loans to students in financial need.

VETERANS FINANCIAL AID

New students, including Nontraditional Pathway students, who are eligible for educational benefits through the Veterans Administration should forward a completed VA Form 22-1995: Request for Change of Program or Place of Training to the Office of Student Affairs. Veterans who have not used any of their VA educational benefits should forward a completed VA Form 22-1990: Application for Program of Education or Training and a copy of DD 214: Separation Papers directly to the Office of Student Affairs of the School of Pharmacy, Room 224 Pharmacy Hall.

PHD STUDENT FINANCIAL AID

For information on financial support, graduate students should contact the graduate department to which they are applying.

PharmD Academic Policy Statements

The School reserves the right to make changes in standards for advancement and graduation and rules and regulations. The following academic policy statements shall not be construed as a contract between any student and the School:

ACADEMIC SESSIONS

The School of Pharmacy operates on a four-semester calendar. The fall term, four months long, begins the last week of August and runs to the Christmas recess. A three-week winter minimester in January allows students to avail themselves of tutorial services or elective courses. The spring term, four months long, begins the last week in January and extends to just before Memorial Day. Full-time students enrolled for the spring semester do not pay tuition and fees for campus courses they take during the January minimester. Student must pay additional minimester tuition at other University System of Maryland (USM) campuses. The School does not offer any courses during the summer session. Students may take didactic courses at USM institutions but must pay summer session tuition and fees at those institutions.

REGISTRATION POLICIES

CANCELLATION OF REGISTRATION

Students who register and subsequently decide not to attend the School of Pharmacy *must provide written notice* to the Office of Student Affairs on or before the first day of class. If this office has not received a request for cancellation by 5 p.m. on or before the first day of instruction, the University will assume that students plan to attend and that they accept their financial obligation.

CHANGE IN REGISTRATION

All registration changes can be entered during *Web registration* from the beginning of advanced registration until the last day before classes start. Students can *ADD* classes up to the first week of instruction and *DROP* classes four weeks after the start of classes. On and after the first day of class, all transactions must be submitted on appropriate paper forms, directly to the Office of Student Affairs, within the designated deadline (see academic calendar).

LATE REGISTRATION

Students who fail to complete registration by the specified time for regular registration, usually the day before the first day of classes, pay a late registration fee. (See the "Financial Information" section of this catalog for fee amount.)

WITHDRAWAL FROM THE UNIVERSITY

Students who withdraw from the University before the end of a semester are eligible for partial refunds, depending upon the date of withdrawal. To ensure such refunds, students must file withdrawal forms in the School's Office of Student Affairs. Students who fail to complete these forms will receive failing grades in all courses and forfeit their right to any refund.

GRADING SYSTEM

When, for any reason, a student repeats a course, the grade achieved in the repeated course replaces all previous grades in the same course. The School of Pharmacy uses the following grading system:

GRADE	INTERPRETATION	POINT VALUE
A	Excellent	4
B	Good	3
C	Fair	2
D	Poor but Passing	1
P	Pass	0
F	Failure	0
I	Incomplete	Must be replaced by definite grade within one year
WD	Withdrawal	No grade is assigned

ACADEMIC STATUS POLICIES

Students' performance in didactic and experiential learning courses is continually monitored. Students are responsible for their academic progress and should take the initiative to meet their academic advisor and/or the coursemaster(s) when academic problems occur. The director for student services, the class advisor, faculty, and administration are available to help students meet the School's academic standards. Experience has demonstrated that the earlier and more actively students recognize and address potential problems, the greater their likelihood of avoiding academic difficulties. By the same token, faculty members are encour-

aged to initiate discussions with students whose performance appears likely to result in a failing grade.

To remain in acceptable academic standing and to be eligible for graduation, students must maintain a minimum cumulative GPA of 2.0 in required courses. Students with a cumulative GPA below 2.0 or a failing grade in a didactic or experiential learning course are subject to academic dismissal. Students must pass all first- and second-year courses before advancing to the third year; and all third year courses before advancing to fourth-year courses.

At the end of each semester, the associate dean of student affairs reviews the academic status of all students in the PharmD program. Students with a failing grade in any course are subject to academic dismissal as soon as the failing grade is submitted in writing to the Office of Student Affairs. Students who do not achieve a minimum cumulative GPA of 2.0 in their required courses are subject to academic dismissal.

Students who have a semester GPA below 2.0 but maintain a cumulative GPA of 2.0 or greater will receive a letter of academic warning from the associate dean of student affairs. The chair of the Student Affairs Committee and students' academic advisors also receive a copy of this letter.

The associate dean of student affairs will send a notification letter and a copy of the Academic Status Policies and Procedures to students subject to academic dismissal. The letter will indicate that the student will be dismissed from the School unless he or she appeals to the Student Affairs Committee requesting to be placed on academic probation. The letter will state the time and place of the academic review hearing with the Student Affairs Committee (typically, within seven calendar days of the letter's date). The chair of the Student Affairs Committee and students' academic advisors also receive copies of the letter.

Students subject to academic dismissal have the right to appeal to the Student Affairs Committee. Students may present their case in person before the committee or submit a written appeal. Students may submit any documents that they deem pertinent. Students who do not appeal will be dismissed from the School.

At least seven calendar days before any Student Affairs Committee academic review hearing, the committee will distribute a confidential memo to the faculty, listing all students to be reviewed. The memo will state the time and place of the hearing, stress the confidential nature of the information, and request that faculty provide the committee with pertinent information on students' academic performance and ability. Any faculty member may provide written comments to the committee or request permission to appear at any student's hearing.

Academic advisors and other faculty members may attend academic review hearings and present pertinent information. The committee will consider prepharmacy grades, prior academic performance in the School, and personal issues in its deliberations.

At the conclusion of the academic review hearing, the committee will deliberate on each case and determine each student's academic status. The committee decides by a simple majority vote to either academically dismiss students, place them on academic probation, or gather more information. If placed on academic probation, students will be allowed to continue in the program but under specific terms outlined by the committee, such as taking remedial courses to strengthen

specific knowledge or skills. If the committee decides to gather more information, it must complete its review and make a final decision within five calendar days of the original hearing. The committee will submit its decision in writing to the students, dean, and the students' academic advisors within seven calendar days of the academic review hearing.

Students have the right to appeal the decision of the Student Affairs Committee directly to the dean. Students must submit appeals in writing and state the basis for the appeal. Students must complete all appeals before the beginning of the next semester. The dean's decision is final.

Students on academic probation must meet with their academic advisor and the associate dean of student affairs to develop a plan of action to resolve all pertinent academic issues. While on probation, students must earn a GPA of 2.0 or greater during each semester. If students on probation earn a semester GPA of 2.0 or greater, but the cumulative GPA or the required-course GPA remains below 2.0, students will remain on academic probation. Students will be removed from probation when their cumulative GPA and required-course GPA is 2.0 or greater. Students with a failing grade on their record will remain on probation until they receive a passing grade.

Students who are academically dismissed may petition the Admissions Committee for readmission after they have completed some form of remediation. Students who have been academically dismissed twice from the School are not eligible for readmission.

ACADEMIC INTEGRITY POLICIES AND PROCEDURES

Students are entering a profession highly trusted by the public. Therefore, students are expected to "maintain the highest principle of moral, ethical, and legal conduct." (Oath of a Pharmacist, 1999.) Students and faculty developed the policies and procedures described below to help maintain the School's high standard of conduct.

STUDENT HONOR CODE

Students entering the profession of pharmacy are required to exhibit exemplary standards of conduct. Absolute honesty is imperative for a health professional. On May 14, 1998, the Student Government Association adopted the following *Honor Code*.

I. Statement of Philosophy

The students of the University of Maryland School of Pharmacy recognize that honesty, truth, and integrity are values central to the School's mission as an institution of higher education. Therefore, the Student Government Association has assembled current policies and procedures involving academic integrity into this *Honor Code* of behavior. The code described in this document articulates the responsibilities of Doctor of Pharmacy students, graduate students, faculty, and

administration in upholding academic integrity, while at the same time respecting the rights of individuals to the due process offered by administrative hearings and appeals. All persons enrolled in any course or program offered by the University of Maryland School of Pharmacy and all persons supervising the learning of any student are responsible for acting in accordance with the provisions of this policy.

Students' Responsibilities

- Understanding the types of conduct which are deemed unacceptable and, therefore, are prohibited by this policy.
- Refraining from committing any act of cheating, plagiarizing, facilitating academic dishonesty, abusing academic materials, stealing, or lying.
- Reporting every instance in which the student has a suspicion or knowledge that academic conduct which violates this policy or its spirit has taken place to the faculty member responsible for instruction or to a member of the Student Discipline and Grievance Committee.

Faculty Responsibilities

- Understanding the procedures of this policy relative to how faculty are to handle suspected instances of academic dishonesty.
- Developing an instructional environment that reflects a commitment to maintaining and enforcing academic integrity.
- Handling every suspected or admitted instance of the violation of the provisions of this policy in accordance with the current School and University procedures.

II. Academic Integrity

In attempt to maintain academic integrity, the Student Government Association has outlined a code of conduct (an Honor Code) which describes acceptable behavior for students in all its academic settings. This code has been developed using University (as stated in the University's Student Answer Book) and School (as stated in the School's catalog) policies. Elements of this code can be categorized into six broad areas:

1. **Cheating** Definition: Using or attempting to use unauthorized materials, information, notes, study aids or other devices, or obtaining unauthorized assistance from any source for work submitted as one's own individual efforts in any class, clinic, assignment, or examination. Examples of cheating include, but are not limited to, the following actions:
 - a. Copying from another student's paper or test, or receiving assistance from another person during an exam or other assignment in a manner not authorized by the instructor.
 - b. Possessing, buying, selling, removing, receiving, or using at any time or in any manner not previously authorized by the instructor a copy or copies of any exam or other materials (in whole or in part) intended to be used as an instrument of evaluation in advance of its administration.

- c. Using material or equipment not authorized by the instructor during a test or other academic evaluation, such as crib notes, a calculator, or a tape recorder.
 - d. Working with another or others on any exam, take home exam, computer or laboratory work, or any other assignment when the instructor has required independent and unaided effort.
 - e. Attempting to influence or change an academic evaluation, grade or record by deceit or unfair means, such as: 1) damaging the academic work of another student to gain an unfair advantage in an academic evaluation; or 2) marking or submitting an exam or other assignment in a manner designed to deceive the grading system.
 - f. Submitting, without prior permission, the same academic work which has been submitted in identical or similar form in another class or in fulfillment of any other academic requirement at the University.
 - g. Permitting another to substitute for oneself during an exam or any other type of academic evaluation.
 - h. Gaining an unfair advantage in an academic evaluation by receiving specific information about a test, exam, or other assignment.
2. **Plagiarism** Definition: Representing, orally or in writing, in any academic assignment or exercise, the words, ideas, or works of another as one's own without customary and proper acknowledgment of the source. Examples:
- a. Submitting material or work for evaluation, in whole or in part, which has been prepared by an individual(s) or commercial service.
 - b. Directly quoting from a source without the customary or proper citation.
 - c. Paraphrasing or summarizing another's work without acknowledging the source.
 - d. Downloading material from Web sites without appropriate documentation.
3. **Facilitating Academic Dishonesty** Definition: Helping or attempting to help another person commit an act of academic dishonesty. Examples:
- a. Providing assistance to another during an exam or other assignment in a manner not authorized by the instructor.
 - b. Acting as a substitute for another in any exam or any other type of academic evaluation.
 - c. Providing specific information about a recently given test, exam, or other assignment to another student who thereby gains an unfair advantage in an academic evaluation.
 - d. Permitting one's academic work to be represented as the work of another.
 - e. Preparing for sale, barter, or loan to another such items as unauthorized papers, notes, or abstracts of lectures and readings.
4. **Abuse of Academic Materials** Definition: Destroying or making inaccessible academic resource materials. Examples:

- a. Destroying, hiding, or otherwise making unavailable for common use library, computer, or other academic reference materials.
 - b. Destroying, hiding, or otherwise making unavailable another's notes, experiments, computer programs, or other academic work.
5. **Stealing** Definition: Taking, attempting to take, or withholding the property of another, thereby permanently or temporarily depriving the owner of its use or possession. Examples:
- a. Unauthorized removal of library materials, examinations, computer programs, or any other academic materials, including obtaining advance access to an examination through collusion with a University employee or otherwise.
 - b. Taking another's academic work, such as papers, computer programs, laboratory experiments, or research results.
6. **Lying** Definition: Making any oral or written statement which the individual knows to be untrue. Examples:
- a. Making a false statement to any instructor or other University employee in an attempt to gain advantage or exception.
 - b. Falsifying evidence or testifying falsely, such as in a Student Grievance Committee hearing.
 - c. Inventing or counterfeiting data, research results, research procedures, internship or practicum experiences, or other information.
 - d. Citing a false source for referenced material/data.

III. Honor Pledge

To address the first two areas, cheating and plagiarism, the School has developed an honor pledge statement that has been used by many faculty members to reinforce the importance of academic integrity. This pledge statement will be used in the following manner: Work assigned for classes, clinics, internships, and all other types of instruction offered at the School of Pharmacy may be accomplished in either of two ways: (1) as "individual" work for which the student will sign a pledge statement indicating that the work was completed independently, without giving or receiving assistance from another; or (2) as "collaborative" work, which may be completed in collaboration with others as directed by the instructor and for which no pledge statement is required. All work is considered to be individual work unless the instructor specifies otherwise. For all "individual" work, instructors may require students to sign the following pledge statement:

"On my honor, I have neither given nor received aid on this assignment."
 Student's signature: _____ Date: _____

Thus, students will state that the work that was submitted is their own and will be held accountable if evidence appears that is contrary to this statement. Students are reminded that neither the presence nor the absence of a signed pledge statement will allow students to violate established codes of conduct as described above.

IV. Disciplinary Procedures

As stated below, the Student Discipline and Grievance Committee will be responsible for implementing and monitoring aspects of this code for Doctor of Pharmacy students. A separate set of procedures is in place for graduate students. They should contact their graduate program director for further information. PharmD students who are found guilty of a violation of academic integrity standards will be subject to penalties deemed appropriate by the Student Discipline and Grievance Committee as stated in the committee's policies and procedures. It is the committee's duty to protect honest students from being taken advantage of by those who behave dishonestly. The committee will ensure any accused student of certain rights: to be informed in writing of the charges, to hear evidence presented, to question witnesses, and to present witnesses. The committee shall maintain confidentiality regarding names of persons involved in honor cases. The principles and problems raised by cases, however, may be discussed with appropriate administrative and faculty representatives.

STUDENT DISCIPLINE AND GRIEVANCE COMMITTEE

I. Purpose

The Student Discipline and Grievance Committee ("committee") is established in the School of Pharmacy to foster the self governance of the student body. The committee hears and attempts to solve problems or complaints ("grievances") that involve professional students. Grievances against graduate students or faculty members are handled under separate policies and procedures.

Most grievances are brought directly to the committee. However, some incidents involving students may be resolved outside the formal grievance process. Students and faculty members are encouraged to consult with the director of student services who will serve as an ombudsman for the potential grievants and may triage the issues to appropriate parties. These initial meetings will be held in confidence to encourage disclosure. Potential grievants (either faculty members or students) will receive a list of options that are available to them in order to resolve issues (see Appendix A). If desired, potential grievants may request a Preliminary Evaluation by members of the committee (see *Part IV: Preliminary Evaluation*) in order to assess whether or not the situation is grievable. Students and faculty members may file a formal grievance with the committee at any time for issues outlined in *Section III. Grievances*.

In certain situations, the dean or any of the associate deans can enforce administrative dismissal or probation for just cause in situations involving criminal activity, potential injury to members of the School's community, or other actions that demand an immediate action. Due to confidentiality issues, the administration may not be able to share specific details of the situation until a formal grievance is filed with the committee. The committee will review these emergency situations in a timely manner and will conduct formal hearings to determine long-term courses of action for the accused.

II. Committee Composition

The Student Discipline and Grievance Committee, a sub-committee of the Student Affairs Committee, is composed of seven voting members: four students and three faculty members. The student members of the committee include the Student Government Association (SGA) president, the second- and third-year class presidents, and the most senior student member of the Student Affairs Committee. If a grievance is made against a Nontraditional PharmD (NTPD) Pathway student, an NTPD student will replace the most senior student member of the Student Affairs Committee. Faculty members include the SGA faculty advisor and the third- and fourth-year class advisors. The SGA president chairs the committee. The associate dean for student affairs serves as an ex-officio member. In the event that a grievance is filed against an NTPD student, the NTPD pathway director will serve as an ex-officio member of the committee.

All members of the committee must be present at formal hearings. Members of the committee who cannot attend the hearing or must recuse themselves due to a conflict of interest will notify the chair immediately. In the event that a committee member cannot attend a formal hearing, the committee chair shall appoint a replacement. Each student member of the committee unable to attend will be replaced by an elected officer in the SGA or a member of the NTPD advisory board. Each faculty member of the committee unable to attend will be replaced by a faculty member, preferably a member of the Student Affairs Committee.

III. Grievances

A student, a group of students, or a faculty member ("grievant") may bring a grievance against a student or a group of students ("respondent") for any act that is unethical or causes injury or damage. Grievances may include, but are not limited to acts of discrimination based on race, age, gender, ethnicity, religion, sexual orientation, marital status, physical or mental handicap; violations of academic integrity; violations of University or School policies (see School of Pharmacy catalog); lewd, obscene, or disruptive behavior on University premises or at University-supervised activities; sexual harassment; threatening or abusive communication to members of the University community; intentionally initiating any false report or threat of fire, explosion, or other emergency; violations of Baltimore City, state, or federal law.

IV. Preliminary Evaluation

A grievance must be submitted in writing to the SGA president, the SGA advisor, or the association dean of academic affairs. Within five days of receipt of a written grievance, the SGA president, the SGA advisor, the associate dean for student affairs, and either the most senior student member of the Student Affairs Committee or an NTPD student (as applicable) will review the facts presented and determine if the matter is grievable under this policy. If two or more individuals during the preliminary evaluation believe the matter is grievable, a formal hearing will be called by the committee chair. If the majority believes the matter is not grievable, the associate dean for student affairs will counsel the grievant on alternatives.

V. Grievance Procedure

Once the grievance is determined to be grievable, the respondent will be sent a letter from the committee chair and the associate dean of academic affairs stating: 1) that a formal grievance has been filed; 2) the deadline for submission of a written rebuttal and a proposed date(s) for the formal hearing; and 3) advice and counsel should be sought from the academic advisor. Along with the letter, the respondent will be provided with a written copy of the grievance and this policy. The respondent will be given up to 10 days to provide a written response to the committee chair. The committee will hold a formal hearing no more than five days after the deadline for receipt of the respondent's written response.

Prior to the hearing, the grievant's allegations and any supporting information will be provided to the respondent for review. Likewise, the respondent's allegations and evidence shall be provided to the grievant for review. The associate dean for academic affairs will facilitate this exchange of information. If feasible, supporting evidence will be made available to both parties no less than three days before the scheduled hearing.

The formal hearing is an internal academic process; legal counsel will not be permitted to represent either the grievant or the respondent. The grievance is presented to the committee by the grievant or by a representative of the dean's office, in the presence of the respondent. The presenter of the grievance may call witnesses to present relevant information. The witnesses supporting the grievant may be questioned by the respondent and committee members.

The respondent has the right to refuse to appear before the committee and the right to remain silent during the hearing. Refusal to appear will not be taken as an admission of guilt. The respondent has the right to: 1) present a statement in the respondent's own behalf at the hearing; 2) present witnesses having relevant information pertaining to the grievance; and 3) present relevant evidence in the form of written or tangible materials. The witnesses supporting the respondent may be questioned by the grievant and committee members.

The hearings will not be open to the public. All witnesses will be excluded from the hearing room until they are called to testify. All witnesses will be asked to affirm that any information they are presenting, including any written materials, is accurate and complete to the best of their knowledge and belief.

Upon completion of the hearing, the committee will meet in closed session to determine whether the grievance has been proven by the preponderance of the evidence; that is, whether on the basis of the evidence, it is more likely than not that the grievance is a correct allegation. The chair will remind the committee that it is to be free of bias concerning all aspects of the case in question. Members who wish to excuse themselves from the voting due to possible bias may do so.

The method of voting shall be by secret ballot. To sustain the grievance, a majority vote of both the faculty and student committee members is required. All other questions before the committee may be decided by a simple majority vote.

If the vote is that a grievance is not sustained, the case is closed. A record of the case will be kept in the committee's files until the respondent leaves the University. If a grievance is sustained, the committee will decide on a course of action.

VI. Course of Action

Following a vote sustaining a grievance against a respondent, the committee must take one of the following courses of action:

1. Prepare a disciplinary letter stating that the respondent acted with impropriety. This letter is not entered into the student's file but is retained in the committee's file until the student has left the School. The letter will be sent to the respondent within three days of the Grievance Committee hearing. A copy of said letter will be sent to the grievant.
2. Prepare a temporary letter of censure to remain in the student's file for at least one year. The respondent and grievant will be informed in writing within three days of the Grievance Committee's action.
3. Prepare a letter of censure to remain in the student's file permanently. The respondent and grievant will be informed in writing within three days of the grievance committee's action.
4. Recommend to the Student Affairs Committee that the respondent be placed on disciplinary probation, not to exceed one year.
5. Recommend to the Student Affairs Committee that the respondent be suspended from the School for a period of time not to exceed one year.
6. Recommend to the Student Affairs Committee that the respondent be dismissed from the School.

In addition to the actions stated above, the committee may place other requirements on the respondent that relate to the case (e.g., to make restitution or repairs when property is damaged, to seek counseling for emotional issues).

VII. Appeal to the Dean

A respondent or grievant may appeal any recommended action to the dean. The appeal must be made in writing and must be filed in the dean's office. The appeal should describe the basis for the appeal. The appeal must be based on new evidence or relevant facts not produced in the hearing; a claim of inadequate consideration of specific evidence; a claim that a rule or regulation of the University or School applied in the case is not applicable; or a claim that the disciplinary action is unduly severe or lenient.

After reviewing the Grievance Committee's report, the recommendation from the Student Affairs Committee, and any appeal(s) from the respondent or grievant the dean will make a final decision to accept the recommendation or remand the matter for reconsideration to the Grievance Committee. The dean will generally make a final decision within 14 days after receiving the Student Affairs Committee's recommendation and the Grievance Committee's report. If the appeal is denied, the dean's action is final.

VIII. Administrative Issues

1. Once the grievance process is completed, including any appeal, a record of the case will be kept in the dean's office. The names of the grievant and respondent and the facts of the case will be kept strictly confidential by members of the committee. At the end of each academic year, the chair of the Student Affairs Committee will write an annual report sum-

marizing the activity of the Grievance Committee. The report will be submitted to the dean and the Faculty Assembly.

2. Grievances will be handled as swiftly as possible. The times set forth in this policy are calendar days. Due to the academic schedule, it may not be possible to observe the usual deadlines in all cases. If there is good cause in the opinion of the committee chair, the deadlines may be extended for a reasonable period. Likewise, when the outcome of a matter may relate to pending academic action (e.g., graduation), deadlines may be sooner, provided that the respondent agrees. A grievance of such severity that it might affect the respondent's eligibility to graduate will be considered on very short notice, with the respondent's consent. Otherwise, graduation will be deferred pending resolution of the matter.
3. The committee chair may exclude from consideration repetitive or irrelevant evidence.
4. Some matters may involve witnesses who are not affiliated with the School or evidence which must be obtained from parties other than the School and its students and faculty. The School will cooperate with the grievants and respondents in requesting that such information be brought into grievance procedures as appropriate. Written statements are acceptable when personal appearance is impractical. However, no grievance process shall be terminated or abandoned due to the inability of the School to compel the appearance of a witnesses or presentation of evidence. A grievance will be decided on the basis of evidence presented. Lack of witnesses or evidence will not create presumptions that the testimony and evidence would be favorable to the grievant or the respondent.
5. A grievance may involve facts that are the basis of criminal charges against a respondent. The dean will consider a request by a respondent to delay committee action, or final decision, pending the outcome of the criminal investigation. Such requests will be granted only when considered in the best interest of the School. In cases involving felony charges directly involving the School, suspension pending outcome of the criminal matter may be a condition of delaying the grievance process.
6. If placed on disciplinary probation, a student may not participate in School or University sponsored extracurricular activities or serve as an officer in any School or University organization. At the end of the disciplinary probation period, the student will be placed in good standing. If suspended, the student may apply to the dean's office for reinstatement at the end of the suspension period. A record of the disciplinary probation, suspension, or dismissal will be entered in the student's permanent transcript and file.
7. This policy does not apply to academic status within the School.

OPTIONS AVAILABLE TO STUDENTS AND FACULTY REGARDING STUDENT GRIEVANCES

Students and faculty who have witnessed an action by a student that violates the School's or University's code of conduct, have a variety of options to pursue. Grievances may include, but are not limited to acts of discrimination based on race, age, gender, ethnicity, religion, sexual orientation, marital status, physical or mental handicap; violations of academic integrity; violations of University or School policies; lewd, obscene, or disruptive behavior on University premises or at University-supervised activities; sexual harassment; threatening or abusive communication to members of the University community; intentionally initiating any false report or threat of fire, explosion, or other emergency; violations of Baltimore City, state, or federal law.

Possible actions that may be taken include the following:

1. Consulting with the director of student services regarding informal resolution of problems.
2. Filing a formal grievance in writing to the SGA president, the SGA advisor, or the associate dean of student affairs.
3. Asking another party (student, faculty member, or administrator) to file the grievance on your behalf if you feel that you do not want to file the grievance but feel compelled to act in this situation.
4. Speaking at the Discipline and Grievance Committee Hearing, or if you do not want to appear, writing a statement to be read at the hearing.
5. Seeking outside legal counsel and pursuing the case in the local or state legal system if you feel that the situation involves criminal or civil action against you by the accused.

OTHER SCHOOL POLICY STATEMENTS

The School has policy statements relating to other matters, e.g., posting, computer use, etc., listed on the Web site *www.pharmacy.umaryland.edu*.

University of Maryland

Policy Excerpts

No provision of this publication shall be construed as a contract between any applicant or student and the University of Maryland. The University reserves the right to change any admission or advancement requirement at any time. The University further reserves the right to ask a student to withdraw at any time when it is considered to be in the best interest of University. Admission and curriculum requirements are subject to change without prior notice.

The University publishes the full text of the following policies and additional policies and procedures in the Student Answer Book. Students who do not receive the Student Answer Book each fall should call the Office of Student Services at 410-706-7117 (Voice/TTD). The Student Answer Book is online at www.umaryland.edu/student/sabl. Additional University policies are online at www.umaryland.edu/policies.

ELIGIBILITY TO REGISTER

A student may register at the University when the following conditions are met: (1) the student is accepted to the University, (2) the student has received approval from the unit academic administrator, and (3) the student has demonstrated academic and financial eligibility.

FACULTY, STUDENT, AND INSTITUTIONAL RIGHTS AND RESPONSIBILITIES FOR ACADEMIC INTEGRITY

Preamble

The academic enterprise is characterized by reasoned discussion between student and teacher, a mutual respect for the learning and teaching process, and intellectual honesty in the pursuit of new knowledge. By tradition, students and teachers have certain rights and responsibilities which they bring to the academic community. While the following statements do not imply a contract between the teacher or the institution and the student, they are nevertheless conventions which should be central to the learning and teaching process.

I. Faculty Rights and Responsibilities

- A. Faculty members shall share with students and administrators the responsibility for academic integrity.
- B. Faculty members shall enjoy freedom in the classroom to discuss subject matter reasonably related to the course. In turn, they have the responsibility to encourage free and honest inquiry and expression on the part of students.

- C. Faculty members, consistent with the principles of academic freedom, have the responsibility to present courses that are consistent with their descriptions in the catalog of the institution. In addition, faculty members have the obligation to make students aware of the expectations in the course, the evaluation procedures, and the grading policy.
- D. Faculty members are obligated to evaluate students fairly, equitably, and in a manner appropriate to the course and its objectives. Grades must be assigned without prejudice or bias.
- E. Faculty members shall make all reasonable efforts to prevent the occurrence of academic dishonesty through appropriate design and administration of assignments and examinations, careful safeguarding of course materials and examinations, and regular reassessment of evaluation procedures.
- F. When instances of academic dishonesty are suspected, faculty members shall have the responsibility to see that appropriate action is taken in accordance with institutional regulations.

II. Student Rights and Responsibilities

- A. Students share with faculty members and administrators the responsibility for academic integrity.
- B. Students have the right of free and honest inquiry and expression in their courses. In addition, students have the right to know the requirements of their courses and to know the manner in which they will be evaluated and graded.
- C. Students have the obligation to complete the requirements of their courses in the time and manner prescribed and to submit to evaluation of their work.
- D. Students have the right to be evaluated fairly, equitably, and in a timely manner appropriate to the course and its objectives.
- E. Students shall not submit as their own work any work which has been prepared by others. Outside assistance in the preparation of this work, such as librarian assistance, tutorial assistance, typing assistance or such special assistance as may be specified or approved by the appropriate faculty members, is allowed.
- F. Students shall make all reasonable efforts to prevent the occurrence of academic dishonesty. They shall by their own example encourage academic integrity and shall themselves refrain from acts of cheating and plagiarism or other acts of academic dishonesty.
- G. When instances of academic dishonesty are suspected, students shall have the right and responsibility to bring this to the attention of the faculty or other appropriate authority.

III. Institutional Responsibilities

- A. Constituent institutions of the University System of Maryland shall take appropriate measures to foster academic integrity in the classroom.
- B. Each institution shall take steps to define acts of academic dishonesty, to ensure procedures for due process for students accused or suspected

of acts of academic dishonesty, and to impose appropriate sanctions on students found to be guilty of acts of academic dishonesty.

- C. Students expelled or suspended for reasons of academic dishonesty by any institution in the University System of Maryland shall not be admissible to any other USM institution if expelled, or during any period of suspension.

Approved November 30, 1989, by the Board of Regents.

SCHEDULING OF ACADEMIC ASSIGNMENTS ON DATES OF RELIGIOUS OBSERVANCE

It is the policy of the University of Maryland to excuse the absence(s) of students that result from the observance of religious holidays. Students shall be given the opportunity, whenever feasible, to make up, within a reasonable time, any academic assignments that are missed due to individual participation in religious observances. Opportunities to make up missed academic assignments shall be timely and shall not interfere with the regular academic assignments of the student. Each school/academic unit shall adopt procedures to ensure implementation of this policy.

CONFIDENTIALITY AND DISCLOSURE OF STUDENT RECORDS

It is the policy of the University of Maryland to adhere to the Family Educational Rights and Privacy Act (Buckley Amendment). As such, it is the policy of the University (1) to permit students to inspect their education records, (2) to limit disclosure to others of personally identifiable information from education records without students' prior written consent, and (3) to provide students the opportunity to seek correction of their education records where appropriate. Each school shall develop policies to ensure that this policy is implemented.

SERVICE TO THOSE WITH INFECTIOUS DISEASES

It is the policy of the University of Maryland to provide education and training to students for the purpose of providing care and service to all persons. The institution will employ appropriate precautions to protect providers in a manner meeting the patients' or clients' requirements, yet protecting the interest of students and faculty participating in the provision of such care or service.

No student will be permitted to refuse to provide care or service to any assigned person in the absence of special circumstances placing the student at increased risk for an infectious disease. Any student who refuses to treat or serve an assigned person without prior consent of the school involved will be subject to penalties under appropriate academic procedures, such penalties to include suspension or dismissal.

UNIVERSITY OF MARYLAND POSITION ON ACTS OF VIOLENCE AND EXTREMISM WHICH ARE RACIALLY, ETHNICALLY, RELIGIOUSLY, OR POLITICALLY MOTIVATED

The Board of Regents strongly condemns criminal acts of destruction or violence against a person or the property of others. Individuals committing such acts at any campus or facility of the University will be subject to swift campus judicial and personnel action, including possible suspension, expulsion, or termination, as well as possible state criminal proceedings.

STUDENT RESIDENCY CLASSIFICATION FOR ADMISSION, TUITION, AND CHARGE-DIFFERENTIAL PURPOSES

I. Policy

It is the policy of the University System of Maryland Board of Regents to recognize the categories of in-state and out-of-state students for purposes of admission, tuition, and charge differentials at those constituent institutions where such differentiation has been established. The student is responsible for providing the information necessary to establish eligibility for in-state resident status.

Students who are financially independent or financially dependent, as defined herein, shall have their residency classification determined on the basis of permanent residency which for purposes of this policy shall be determined by the criteria set forth in I.A. through E. below. A student will be assigned in-state status for admission, tuition, and charge-differential purposes only if the student, or in the case of a financially dependent student, the student's parent, guardian, or spouse, fulfills all of the following.

- A. For at least 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the petition applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must:
- own and continuously occupy or rent and continuously occupy living quarters in Maryland. There must exist a genuine deed or lease in the individual's name reflecting payments or rents and terms typical of those in the community at the time executed. People not having such a lease may submit an affidavit reflecting payments or rents and terms as well as the name and address of the person to whom payments are made which may be considered as meeting this condition. As an alternative to ownership or rental of living quarters in Maryland, a student may share living quarters in Maryland which are owned or rented and occupied by a parent, legal guardian, or spouse;
 - maintain within Maryland substantially all personal property;
 - pay Maryland income taxes on all earned taxable income, including all taxable income earned outside the state;
 - receive no public assistance from a state other than Maryland or from a city, county, or municipal agency other than one in Maryland; and

- have a legal ability under federal and Maryland law to reside permanently in Maryland without interruption.
- B. For at least 11 consecutive months immediately prior to and including the last date available to register for courses in the semester for which the application applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must:
- register all owned motor vehicles in Maryland, and
 - obtain a valid driver's license issued by the state of Maryland, if licensed to drive in any other jurisdiction.
- C. Within the 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the application applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must register to vote in Maryland, if registered in any other jurisdiction.
- D. A financially independent student classified as in-state loses that status at such time as the student no longer meets one or more of the criteria set forth in I.A. through C above. A financially dependent student classified as in-state loses that status at such time as the parent, guardian, or spouse on whom the status was based no longer meets one or more of those criteria.
- E. In addition, people in the following categories shall be accorded the benefits of in-state status for the period in which any of the following conditions apply:
- a full- or part-time (at least 50 percent) regular employee of the University System of Maryland
 - the spouse or dependent child of a full- or part-time (at least 50 percent) regular employee of the University System of Maryland
 - a full-time active member of the Armed Forces of the United States whose home of residence is Maryland or one who resides or is stationed in Maryland, or the spouse, or a financially-dependent child of such a person
 - for University of Maryland University College, a full-time active member of the Armed Forces of the United States on active duty, or the spouse of a member of the Armed Forces of the United States on active duty
 - a graduate assistant appointed through the University System of Maryland for the semester or session of the appointment. Except through prior arrangement, status is applicable only for enrollment at the institution awarding the assistantship
- F. Students not entitled to in-state status under the preceding paragraphs shall be assigned out-of-state status for admission, tuition, and charge-differential purposes.

II. Procedures

- A. An initial determination of in-state status will be made by the University at the time a student's application for admission is under consideration. The determination made at that time, and any determination made thereafter, shall prevail for each semester or session until the determination is successfully challenged in a timely manner.

- B. A change in residency status must be requested by submitting a University System of Maryland "Petition for Change in Residency Classification for Admission, Tuition and Charge Differential." A student applying for a change to in-state status must furnish all required documentation with the petition by the last published date to register for the forthcoming semester or session for which a residency classification is sought.
- C. The student shall notify the institution in writing within 15 days of any change of circumstances which may alter in-state status.
- D. In the event incomplete, false, or misleading information is presented, the institution may, at its discretion, revoke in-state status and take other disciplinary actions provided for by the institution's policy. If in-state status is gained due to false or misleading information, the University reserves the right to retroactively assess all out-of-state charges for each semester or session affected.
- E. Each institution of the University System of Maryland shall develop and publish additional procedures to implement this policy. Procedures shall provide that on request the president or designee has the authority to waive any residency criterion as set forth in section I, if it is determined that application of the criterion creates an unjust result. These procedures shall be filed with the Office of the Chancellor.

III. Definitions

- A. Financially Dependent: For purposes of this policy, a financially dependent student is one who is claimed as a dependent for tax purposes, or who receives more than one-half of his or her support from a parent, legal guardian, or spouse during the 12-month period immediately prior to the last published date for registration for the semester or session. If a student receives more than one-half of his or her support in the aggregate from a parent, legal guardian, or spouse, the student shall be considered financially dependent on the person providing the greater amount of support. The dependent relationship must have formally existed by legally contracted marriage or court order recognized under the laws of the state of Maryland for at least 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the petition applies.
- B. Financially Independent: A financially independent student is one who (a) declares himself or herself to be financially independent as defined herein, (b) does not appear as a dependent on the federal or state income tax return of any other person, (c) receives less than one-half of his or her support from any other person or people, and (d) demonstrates that he or she provides through self-generated support one-half or more of his or her total expenses.
- C. Parent: A parent may be a natural parent, or if established by a court order recognized under the laws of the state of Maryland, an adoptive parent.
- D. Guardian: A guardian is a person so appointed by a court order recognized under the laws of the state of Maryland.

- E. Spouse: A spouse is a partner in a legally contracted marriage as recognized under the laws of the state of Maryland.
- F. Self-generated: Describes income which is derived solely from compensation for an individual's own efforts as evidenced, for example, by federal or state W-2 forms or IRS Form 1099, in which interest income is based upon finances created from one's own efforts. For the purposes of this policy, grants, stipends, awards, benefits, loans, and gifts (including federal and state aid, grants, and loans) may not be used as self-generated income.
- G. Regular Employee: A regular employee is a person employed by the University System of Maryland who is assigned to a state budget line. Examples of categories not considered regular employees are graduate assistants, contingent employees, if-and-when-needed, and temporaries.

Approved by the University System of Maryland Board of Regents, Aug. 28, 1990; amended Nov. 27, 2000.

STUDENT RIGHT-TO-KNOW AND CAMPUS SECURITY ACT

The Student Right-to-Know and Campus Security Act (Public Law 101 542), signed into federal law Nov. 8, 1990, requires that the University of Maryland make readily available to its students and prospective students the information listed below. Should you wish to obtain any of the following information, send your name, address, school, and program, and a listing of the items of interest to:

Office of Student Services
Attention: Student Right-to-Know Request
University of Maryland
621 W. Lombard St., Room 302
Baltimore, MD 21201

- Financial Aid
- Costs of Attending the University of Maryland
- Refund Policy
- Facilities and Services for Students with Disabilities
- Procedures for Review of School and Campus Accreditation
- Completion and Graduation Rates for Undergraduate Students
- Loan Deferral Under the Peace Corps and Domestic Volunteer Services Act
- Campus Safety and Security
- Campus Crime Statistics
- Student Sexual Orientation Nondiscrimination

STUDENT SEXUAL ORIENTATION NONDISCRIMINATION

I. Background

Effective July 11, 1997, the University System of Maryland Board of Regents specifically prohibited discrimination against students on the basis of sexual orientation in academic admissions, financial aid, educational services, housing, student programs and activities, and recruitment. The board reserved the right to enforce or comply with any federal or state law, regulation or guideline, including conditions for the receipt of federal funding. This University reiterates its commitment to the most fundamental principles of academic freedom, equality of opportunity, and human dignity by requiring that treatment of its students and applicants for admission be based on individual abilities and qualifications and be free from invidious discrimination.

II. Related Employment Policy

University students who are also University employees should be aware of the "Employee Sexual Orientation Nondiscrimination Policy and Procedures."

III. Definition

Sexual orientation is the identification, perception, or status of an individual as to homosexuality, heterosexuality, or bisexuality.

IV. Policy

Consistent with USM's policy, it is this University's policy that:

- within the University, the educational environment will be free of discrimination on the basis of sexual orientation, and
- University students are prohibited from discriminating on the basis of sexual orientation against fellow students, University personnel, and other people with whom the students interact during the course of their educational experiences both on- and off-campus. Students may be disciplined for violation of this policy.

Administration and Faculty

University System of Maryland

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Board of Regents

Clifford M. Kendall, Chairman

Admiral Charles R. Larson (USN Ret.), Vice Chairman

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Robert L. Pevenstein

The Honorable Lewis R. Riley, *ex officio*

The Hon. James C. Rosapepe

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Robert Martin, Jr., BSP, Potomac Valley Pharmacy, Inc.
Theresa Martin, PharmD, Shore Health System
Robert Massey, MSA, Walter Reed Army Medical Center
Herbert G. Mathews III, PharmD, Mt. Washington Pediatric Hospital
Peter T. Mbi, BSP, The Medicine Shoppe
Mark McDougall, BSP, McDougall's Pharmacy
Earle G. McFerren, BSP, CVS Pharmacy
Gina McKnight-Smith, PharmD, MBA, Advance ParadigM Clinical Services
Michael F. McMahan, BSP, Rite Aid Pharmacy
Michelle C. Mercado, PharmD, Children's National Medical Center
Nasir Mian, PharmD, Reston Hospital Center
Martin Mintz, BSP, Northern Pharmacy & Medical Equipment
Rita Mitsch, PharmD, Franklin Square Hospital Center
Laurie Mohler, BSP, NeighborCare Pharmacies, Inc.
Joseph M. Morrissey, MS, Howard County General Hospital
Pam Moussavian-Yousefi, PharmD, Walter Reed Army Medical Center
Jeffrey L. Moyer, BSP, Waynesboro Hospital
Charles Muendlein, BSP, Lykos Pharmacy
Yeruk A. Mulugeta, PharmD, Children's National Medical Center
LaVerne, G. Naesea, MSW, Maryland Board of Pharmacy
Pamela J. Neely, PharmD, All Children's Hospital
Leon Nelson, BSP, Rite Aid Pharmacy

Matthew Nelson, PharmD, VA Medical Center
John Ness, PharmD, Harford Memorial Hospital
Pauline Newman, BSP, The Johns Hopkins Hospital and Health System
Teresa Ng, PharmD, Kaiser Permanente
Trinh M. Nguyen, BSP, Holy Cross Hospital
Mary Ann Niesen, PharmD, Crownpoint Healthcare Facility
Akwasi Nkansah, BSP, Rite Aid Pharmacy
Godwin Odunze, MS, Signet Health Plan
Claudia C. Okeke, PhD, U.S. Pharmacoeopia
Helen Osborn, BSP, Montgomery General Hospital
Richard Ottmar, MBA, Western Maryland Health System
Michele Overtoom, PharmD, Giant Pharmacy
Heather A. Owens, PharmD, University of Maryland Medical System
Larry Owens, PharmD, York Hospital
Victoria C. Paoletti, PharmD, Christiana Care Health System
Joseph Pariser, BSP, Giant Pharmacy
Richard D. Parker, Jr., BSP, Giant Pharmacy
Daniel S. Pastorek, BSP, Shoppers Pharmacy
Ashish Patel, BSP, CVS Pharmacy
Kalpna Patel, MS, Giant Pharmacy
Mira M. Patel, BSP, The Medicine Shoppe
Virbala A. Patel, BSP, Giant Pharmacy
David W. Patterson, BSP, Health Guard
Robert Patti, PharmD, York Hospital
Emilie Paul, PharmD, University of Maryland Medical System
Carol Paulick, MBA, St. Agnes Health Care
James Pellenbarg, BSP, Wal-Mart Pharmacy
David Perrott, BSP, Mt. Washington Pediatric Hospital
Janice V. Perry, PharmD, VA Medical Center
Maureen W. Perry, BSP, Virginia Maryland Regional College of Veterinary
 Medicine
Lynn J. Peterson, BSP, CVS Pharmacy
Wallace Pickworth, PhD, NIDA, Addiction Research Center
Mark Pilachowski, BSP, Klein's Pharmacy
Sanyi Pin, BSP, Bon Secours Hospital
Brian Pinto, PharmD, The Johns Hopkins Hospital and Health System
Rao S. Piratla, MS, The Medicine Shoppe
Bonnie L. Pitt, MAS, Frederick Memorial Hospital
Marilyn R. Pitts, PharmD, Greater Southeast Community Hospital
David Posner, BSP, Bradley Drug
Patricia A.G. Powers, PharmD, Kaiser Permanente
Douglas Pryor, MBA, Maryland General Hospital
Frank Pucino, Jr., PharmD, National Institutes of Health
Jacob Raitt, PhD, Vetcentric
Ashok A. Ramkissoon, BSP, MAMSI
William A. Ranker, PharmD, Safeway Pharmacy

Diane T. Raum, BSP, Safeway Pharmacy
James P. Reuter, PharmD, University of Maryland Medical System
Earl W. Rhoads, BSP, The Medicine Shoppe
Wendy L. Rice, PharmD, Pharmacare of Cumberland
Stephen P. Rigglin, BSP, CVS Pharmacy
Arthur Riley, MS, EMA Pharmacy, Inc.
Carol Ritchie, BSP, Thomas B. Finan Center
Kim Z. Robbins, BSP, Happy Harry's Pharmacy
Michael D. Roberts, MS, National Rehabilitation Hospital
David Rochlin, BSP, Giant Pharmacy
Amilcar Rodriguez, MS, National Naval Medical Center
Luis F. Rosado, BSP, Rite Aid Pharmacy
Dennis Rosenbloom, PharmD, Rexall Pharmacy
Wendy M. Rosenthal, PharmD, MedOutcomes, Inc.
Michelle A. Rudek, PhD, Sidney Kimmel Comprehensive Cancer Center
Carol Rudo, PharmD, VA Medical Center
David Russo, MBA, Russo's Pharmacy
James J. Rybacki, PharmD, The Clearwater Group
Constanta E. Samborschi, PhD, Upper Shore Community Mental Health Center
Cyrus Samet, PharmD, Suburban Hospital
Angela M. Scagiola, BSP, Harford Memorial Hospital
Joseph J. Scalese III, BSP, Weis Pharmacy
Randolph Schaap, BSP, Rite Aid Pharmacy
Edward Schairer, BSP, Weis Pharmacy
Howard R. Schiff, BSP, Maryland Pharmacists Association
Angelica Schneider, BSP, NeighborCare Pharmacies, Inc.
Kevin A. Schnupp, PharmD, Maryland General Hospital
Joseph Schuman, BSP, Maryland Rehabilitation Center Pharmacy
Brian Schumer, BSP, Tuxedo Pharmacy
Rizwan A. Shah, MS, Weis Pharmacy
Kelly Shanahan, BSP, Giant Pharmacy
Brent Sharf, BSP, Bon Secours Hospital
Aatif M. Sheikh, PharmD, Kimbrough Ambulatory Care Center
Matthew G. Shimoda, PharmD, CVS Pharmacy
Scott A. Shoop, PharmD, Christiana Care Health System
Sudha Shukla, PharmD, VA Medical Center
Lawrence Siegel, MAS, Carroll County Hospital
Cheryl Simmons-Gray, PharmD, Kaiser Permanente
Robert Sinker, BSP, Potomac Village Pharmacy
Melissa Skarbelis, BSP, Wal-Mart Pharmacy
Jann B. Skelton, MBA, Medica
Ralph A. Small, Jr., BSP, Rite Aid Pharmacy
Billy R. Smith, MA, Monarch Pharmaceuticals, Inc.
Jennifer S. Smith, BSP, Acme Pharmacy
John Smith, BSP, Giant Pharmacy
Gary Sobotka, BSP, CVS Pharmacy

Dominic A. Solimando, Jr., MA, Walter Reed Army Medical Center
Suzanne L. Spurr, PharmD, Kmart Pharmacy
Douglas St. John, PharmD, Bayhealth Medical Center
James R. Staffa, BSP, Shoppers Pharmacy
Nora Stelter, PharmD, National Association of Chain Drug Stores
Carol Stevenson, BSP, NeighborCare Pharmacies, Inc.
Jerry C. Stewart, BSP, Western Maryland Health System
Howard C. Stoops, BSP, Mallinckrodt
Gary R. Stout, BSP, Safeway Pharmacy
Mark N. Strong, PharmD, Warm Springs Health & Wellness Center Indian Health
Susan L. Summers, BSP, CVS Pharmacy
Suzanne Suter-Lowe, BSP, Rite Aid Pharmacy
William Tabak, BSP, Rite Aid Pharmacy
Richard Tarr, BSP, Giant Pharmacy
Lawrence Taylor, BSP, CVS Pharmacy
Carl Tepper, BSP, Centers for Medicare and Medicaid Services
Christopher E. Thomas, PharmD, VA Medical Center
Jennifer Thomas, PharmD, St. Agnes HealthCare
Rachel J. Thomas, PharmD, Kaiser Permanente
Karen Thompson, BSP, Tidewater Pharmacy
Amy M. Timmins, PharmD, AstraZeneca Pharmaceuticals, LP
Lisa Townsend, PharmD, Hill's Drug Store
Dat T. Tran, BSP, Super Fresh Pharmacy
Hieu T. Tran, PharmD, Kent General Hospital
Penelope Trikeriotis, BSP, Giant Pharmacy
Kathleen Truelove, BSP, The Johns Hopkins Hospital and Health System
Marshall Tsakiris, BSP, Giant Pharmacy
Richard Tsao, PharmD, Greater Southeast Community Hospital
Sara C. Turk, PharmD, Good Samaritan Hospital
Charles H. Twilley, PharmD, Johns Hopkins Bayview
Nancy D. Tzeng, PharmD, Johns Hopkins Bayview
David J. Vaxmonsky, BSP, Happy Harry's Pharmacy
Michael A. Veltri, PharmD, Johns Hopkins Children's Hospital
Rebecca A. Viola, BSP, Walter Reed Army Medical Center
Doris Voigt, BSP, Kimbrough Ambulatory Care Center
Denise M. Von Rinteln, BSP, MAMSI
James A. Waddell, PharmD, Walter Reed Army Medical Center
J. Kenneth Walters, PharmD, Sheppard Pratt Hospital
Terrill Washington, PharmD, VA Medical Center
D. Raymond Weber, PharmD, Greater Baltimore Medical Center
Michael Weinstein, BSP, The Apothecary
Michael N. Weisburgh, PharmD, The Johns Hopkins Hospital and Health System
Sandra S. Werking, PharmD, Mercy Medical Center
Josephine Whitford, PharmD, Kaiser Permanente

Thomas Wieland, BSP, Safeway Pharmacy
Stephen Wiener, BSP, Mt. Vernon Pharmacy
Anne M. Wiland, PharmD, University of Maryland Medical System
Michelle Willey, PharmD, Shore Health System
Donna C. Williams, BSP, Alpharma
Thomas Williams, PharmD, Wellspan Pharmacy
Rene L. Williamson, PharmD, Kaiser Permanente
Sharon D. Wilson, PharmD, University of Maryland Medical System
Thomas Wilson, PharmD, Cape Apothecary
Dante R. Winter, BSP, Harford Memorial Hospital
Eileen Wu, PharmD, Montgomery General Hospital
Mia Wyatt, BSP, CVS Pharmacy
Martin Yankellow, BSP, Weis Pharmacy
Wayne Yelle, PharmD, Wal-Mart Pharmacy
David M. Yoder, PharmD, MAMSI
Eric J. Yospa, BSP, Family Pharmacy of Hampstead
Deirdre A. Younger, BSP, Health Center Pharmacy
Jonas J. Yousem, BSP, NeighborCare Pharmacies, Inc.
Catherine C. Yu, PharmD, Food and Drug Administration
Faramarz Zarfeshanfard, BSP, The Johns Hopkins Hospital and Health System
C. Alex Zarow, MBA, Bayhealth Medical Center
Robert Zepp, BSP, University of Maryland Medical System

Clinical Instructor

Arash Raoufinia, PharmD, Shire Laboratories, Inc.
Aime P. Service, PharmD, Sam's Club Pharmacy

Program Course Descriptions

PHARMD COURSE DESCRIPTIONS

DIDACTIC REQUIRED COURSES

PHAR 510—Biochemistry (3)

A course of study which builds on the principles of cell biology and genetics with a systematic consideration of the chemical components and requirements of living systems from the molecular to the cellular level. These fundamentals of biochemical structure, function, and energetics provide a platform for comprehension of pharmaceutical biotechnology, and for understanding determinants of disease, the pathobiochemistry of organ systems, mechanisms of drug action and adverse reactions, and novel drug delivery systems.

PHAR 513—Drug Chemistry (2)

A study of the principles of organic chemistry that comprise basic elements of pharmaceutical science. The emphasis is on the relationship between molecular structure and chemical, physical, and biophysical properties of systems that arise from molecular interactions. The course provides a platform for comprehension of pharmaceutical concerns, such as the stability of drugs and drug products, the conformation of bioactive proteins, the basis for drug-receptor interactions, the structure of biological membranes, and major drug classes.

PHAR 514—Human Biology I (3)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology, and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.

PHAR 516—Pharmacy Practice and Education (2)

This prefatory course introduces the new Doctor of Pharmacy student to the science and profession of pharmacy. The evolution and implications of pharmaceutical care and the philosophical basis for the pharmacy curriculum are discussed. Students are introduced to skills necessary for success during the four-year curriculum through the opportunity to critically evaluate problems, discuss ethical dilemmas, develop and apply computer and literature-retrieval skills, and practice verbal and written communication skills. The importance of independent and cooperative learning activities is emphasized.

PHAR 517—Study Design and Analysis (2)

Students are introduced to the pivotal role of study design and statistical analysis considerations in the design and evaluation of basic, clinical, epidemiological, and social science research. The course focuses on the proper design of studies with emphasis on threats to internal validity and generalizability. A variety of descriptive and inferential statistical procedures and methods are surveyed with emphasis on the interpretation of the results of research.

PHAR 520—Molecular Biology (3)

This course is an integrated Cell and Molecular Biology course. It is designed to thoroughly introduce the student to the mechanisms of DNA replication, recombination, repair, transcription, protein synthesis, and gene regulation and signal transduction. The course focuses on the relationship of these processes to current pharmaceutical interventions and those of the future. At the conclusion of this course, the student will also be able to describe, in detail, the mechanisms of DNA metabolism, protein synthesis, gene regulation, and signal transduction. The student will also be able to describe and indicate the basis for current diagnostic tests that incorporate modern Cell and Molecular Biology techniques.

PHAR 522—Context of Health Care (3)

Students actively develop a contemporary definition of health care and critically examine the health care system with special emphasis on relevant legislation, traditional and nontraditional providers of health care, the organization and financing of health care delivery, and the dynamics of pharmaceutical care within the system. The social, legal, and professional implications of informatics and computer proliferation in our society is discussed with special emphasis on pharmacy practice.

PHAR 523—Ethics in Pharmacy Practice (1)

Introduction to the principles of ethical thinking. The philosophy of ethics and role of formal codes of professional conduct are discussed in the context of resolving conflicting ethical principals.

PHAR 524—Human Biology II (3)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology, and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.

PHAR 525—Immunology (2)

The natural and acquired protective mechanisms of the immune system are discussed with topics ranging from the structure, function, and specificity of antibodies; B-lymphocyte and T-lymphocyte functions; initiation and control of immune responses; histocompatibility; and immune-mediated disease. The

course is designed to provide the student with sufficient knowledge of humoral and cellular immunity to understand the role of the immune system in disease, the production and use of vaccines and related biologicals, and the rapidly growing areas of transfusion, transplant, and tumor immunology.

PHAR 526—Physical Chemistry (2)

A study of selected principles of physical chemistry that comprise basic elements of pharmaceutical science. The emphasis is placed on the relationship between molecular structure and the physical and biophysical properties of systems that arise from molecular interactions. The goal of the course is to apply the principles of physical chemistry to the practice of pharmacy.

PHAR 530—Microbiology/Antibiotics I (2)

A study of the major classes of pathogenic bacteria, bacterial infectious diseases and antibacterial agents. This course surveys pertinent features of bacterial structure and virulence factors, host response and disease manifestations and antibacterial drug design, mechanisms, pharmacokinetics, and toxicity profile. This course will provide the framework for consideration of the therapeutic principles involved in treating bacterial diseases.

PHAR 531—Pharmaceutical Chemistry (2)

A presentation of the basic chemical principles underlying the activity, absorption, metabolism, excretion, physico-chemical properties, and design of drug molecules, culminating in a discussion of drug classes.

PHAR 532—Patient Centered Pharmacy Practice and Management I (2)

This course provides pharmacy students an opportunity to learn important pharmacy practice and patient management skills that facilitate the development of a patient-centered pharmacy. The students learn practice management concepts that involve the development, implementation, and management of contemporary pharmacy services including patient assessment skills. Patient assessment principals and skills will be taught including the essential clinical skills of history taking and physical examination.

Management principles are provided to construct a practical framework for the operational management of a business. Elements addressed in this course include regulatory, economic, environmental variables that affect pharmacy practice and workflow analysis, accounting, purchasing and inventory control, quality assurance, summarizing and interpreting of financial data for service and merchandising entities and third-party reimbursement issues. The course also examines the current practical developments related to human resources management through integration of information on organizational behavior, psychology, economics, and law. Prerequisites: PHAR 514 and PHAR 524 Human Biology 1 and 2, PHAR 516 Pharmacy Practice and Education, PHPC 510 and PHPC 520

Introduction to Professional Practice I and II, PHAR 522 Context of Health Care, and PHAR 523 Ethics.

PHAR 533—Medicinal Chemistry I (1)

A comprehensive study of the chemistry of drug products. The course outline will follow the pharmacological classification of drug molecules, and will include discussion of chemical properties (physical and organic), stability, solubility, mechanisms of action where appropriate, and structure-activity relationships. Where possible, quantitative computer designed studies of drug development will be mentioned.

PHAR 534—Human Biology III (3)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology, and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.

PHAR 535—Pharmaceutics (3)

The application of fundamental principles and basic science knowledge to the multidimensional problems of the formulation, development, testing, production, distribution, and administration of safe, effective, stable, and reliable drug delivery systems. These systems, ranging in sophistication from tablets and capsules to biodegradable implants, are discussed using a problem-based approach that focuses on the critical determinants for traditional and less-traditional routes of drug administration.

PHAR 536—Pharmacology I (3)

A systematic consideration of the molecular, cellular, and organismic mechanisms of drug action, organized by major drug classes. This course of study provides knowledge of the mechanisms of drug action underlying their use in the treatment of specific and general disease processes.

PHAR 537—Principles of Drug Action (2)

A study of the chemical and biological concepts which apply to the characterization, evaluation, and comparison of all drugs. Topics such as dose-response and receptor theory, receptor transduction mechanisms, pharmacologic selectivity, pharmacogenetic drug tolerance and dependence, drug allergy, drug resistance and chemical mutagenesis, carcinogenesis, and teratogenesis are discussed at the molecular and cellular level. The physical, biological, and chemical principles underlying drug absorption, distribution, biotransformation, and excretion are discussed from the molecular to the organ level.

PHAR 540—Microbiology/Antibiotics II (2)

A study of the major classes of pathogenic fungi and viruses, the diseases that they cause and antifungal and antiviral agents. This course surveys pertinent features of fungal and viral structure, virulence factors, life-cycle, disease manifestations and antifungal/antiviral drug design, mechanisms, pharmacokinetics, and toxicity profile. This course will provide the framework for consideration of the therapeutic principles involved in treating fungal and viral diseases.

PHAR 541—Biopharmaceutics and Pharmacokinetics (3)

In this course, the student learns how the processes of drug absorption, distribution, metabolism, and excretion are coupled with dosage and the important parameters of clearance, volume of distribution, and bioavailability, to determine the concentration of a drug at its sites of action in the body. The quantitative relationship between dose and effect is developed as a framework with which to interpret measurements of drug concentrations in biological fluids.

PHAR 542—Clinical Chemistry (1)

Principles of analytical chemistry, clinical chemistry, enzyme assays, electrophoresis, radioactivity, magnetic resonance, biotechnology-based diagnostics and biosensors, and immunoassay are examined. Emphasis is on the application of these methods to the determination of drug concentrations in chemical and biological systems, and health promotion and assessment. Students also have opportunities to examine patient data and use commercially available diagnostic kits.

PHAR 543—Medicinal Chemistry II (2)

A comprehensive study of the chemistry of drug products. The course outline will follow the pharmacological classification of drug molecules, and will include discussion of chemical properties (physical and organic), stability, solubility, mechanisms of action where appropriate, and structure-activity relationships. Where possible, quantitative computer designed studies of drug development will be mentioned.

PHAR 544—Patient Centered Pharmacy Practice and Management II (2)

This course provides pharmacy students an opportunity to learn important pharmacy practice and patient management skills that facilitate the development of a patient-centered pharmacy. The students learn practice management concepts that involve the development, implementation, and management of contemporary pharmacy services including patient assessment skills. Patient assessment principals and skills will be taught including the essential clinical skills of history taking and physical examination.

Management principles are provided to construct a practical framework for the operational management of a business. Elements addressed in this course include regulatory, economic, and environmental variables that affect pharmacy practice and workflow analysis, accounting, purchasing and inventory control, quality assurance, summarizing, and interpreting of financial data for service and

merchandising entities and third-party reimbursement issues. The course also examines the current practical developments related to human resources management through integration of information on organizational behavior, psychology, economics, and law. Prerequisites: PHAR 532 Patient-Centered Pharmacy Practice and Management Course, PHAR 514 and PHAR 524-Human Biology 1 and 2, PHAR 516 Pharmacy Practice and Education, PHPC 510 and PHPC 520 Introduction to Professional Practice I and II, PHAR 522 Context of Health Care, and PHAR 523 Ethics.

PHAR 546—Pharmacology II (3)

A systematic consideration of the molecular, cellular, and organismic mechanisms of drug action, organized by major drug classes. This course of study provides knowledge of the mechanisms of drug action underlying their use in the treatment of specific and general disease processes.

PHAR 552—Principles of Human Nutrition (1)

This required course builds on materials in earlier coursework including Fundamentals, Basic Science, and Pharmaceutical Science. The course focuses on the preparation of pharmacists to deliver pharmaceutical care services related to patients' nutritional needs. The course prepares the student to understand principles of nutrition in relation to contemporary public health issues and to treatment of diseases and physiologic processes. The materials taught in this course are applied and further developed in subsequent modules in the Integrated Science and Therapeutics course sequence and in Longitudinal Pharmaceutical Care II.

PHAR 553—Population Based Medical Information Analysis (2)

This course is designed to enhance a student's skills in the areas of information collection, retrieval, analysis, and interpretation. A variety of topics surrounding the aspects of drug information practice will be presented, including the role of informational services in health care. Students will enhance both their written and verbal communication skills as they not only are asked to retrieve pertinent clinical information, but also then to interpret, document, and integrate this information into the development of clinical practice guidelines and subsequent outcome measures.

PHAR 554—Integrated Science and Therapeutics I (4)

PHAR 555—Integrated Science and Therapeutics II (4)

PHAR 564—Integrated Science and Therapeutics III (4)

PHAR 565—Integrated Science and Therapeutics IV (4)

Basic and clinical science faculty interact with students during a variety of didactic and laboratory experiences as students learn to design, implement, and monitor pharmaceutical care plans for specific patients with specific diseases. Methods for the choice of drug product, definition of the specific goals of therapy, including the means to assess whether these goals are being achieved, and active inter-

vention steps at the patient, prescriber, health care system, and population levels to ensure successful outcomes of drug therapy are developed. The courses are organized according to the major physiological systems of the human body, and the disease states commonly associated with them and encountered and observed by the pharmacy practitioner in a variety of community and institutional practice settings. A goal of these courses is to prepare students to be able to better integrate new scientific knowledge into the successful pharmaceutical care of patients with the goal of reducing the health care costs to patients and society. The knowledge and behaviors acquired during these courses prepare the student for the community and institutional pharmaceutical care rotations of the experiential learning program of the curriculum.

PHAR 580—Pharmacy Law (2)

An examination of the legal and regulatory issues pertaining to drugs and devices and the practice of pharmacy. Students learn the various laws and regulations which would govern their usual daily activities in a variety of practice sites.

PHAR 581—Senior Colloquium (1)

Students deliver oral presentations to share some aspect of their educational experience, practice aspirations, or career goals with their student peers and the faculty. This forum fosters a critical examination of each student's formal education in the context of the practice of pharmaceutical care.

EXPERIENTIAL LEARNING REQUIRED COURSES

PHPC 510—Introduction to Professional Practice I (1)

PHPC 520—Introduction to Professional Practice II (1)

Students observe the practice of pharmacy in community, institutional, and specialty practice environments. They analyze the types of services provided in each setting and the personnel involved in the delivery of those services. Students experience the basic elements of safe medication order processing and pharmaceutical care. An important goal of the course is for students to identify and assess career options in pharmacy practice. Activities include laboratory exercises, a career pathway workshop, and Web-based assignments.

PHPC 532—Longitudinal Pharmaceutical Care I (1)

Students observe the delivery of pharmaceutical care to patients over time. Particular attention is paid to assessing the changing needs of patients as health transitions occur. Under the supervision of an experienced pharmacy practitioner, students have regularly scheduled encounters with patients. Students learn how to effectively collect information from a variety of sources, including the patient, and prepare periodic health status reports. As students obtain knowledge and skills in didactic courses (pharmaceutics, pharmacology, human biology), they learn to explicitly apply such knowledge and skills to their patients. (Register Spring Semester, Second Year)

PHPC 562—Longitudinal Pharmaceutical Care II (1)

This course is a continuation of PHAR 532—Longitudinal Pharmaceutical Care I. Students have periodic encounters with assigned patients. Students learn to assess drug therapy problems and develop pharmaceutical care plans. Particular attention is given to the needs of patients during health transitions. These experiential activities are closely linked throughout the third year to the didactic activities in the Integrated Science and Therapeutics series of courses. (Register Spring Semester, Third Year)

PHPC 570—Safe Medication Order Processing in Community Pharmacy (3)

PHPC 571—Safe Medication Order Processing in Institutional Pharmacy (3)

Students may take these courses after successfully completing the second year. PHPC 570 Community and PHPC 571 Institutional are required, three-credit professional practice experiences which target the inter-related elements of safe medication order processing, drug distribution, patient interaction, supervision of pharmacy technicians, use of technology, and practice administration/ personnel management. In both the community and institutional setting, under the supervision of clinical faculty, students will be challenged to develop skill, competence, and efficiency in processing medication orders for distribution to and safe use by patients.

PHPC 572—Community Pharmaceutical Care (3)

PHPC 573—Institutional Pharmaceutical Care (3)

PHPC 574—General Pharmaceutical Care (3)

This series of required professional practice experiences is designed to provide the student with extensive experience in pharmaceutical care delivery in a variety of direct patient care settings. Students gain skill through daily one-on-one interactions with patients, caregivers, physicians, nurses, and other health care professionals. There are four month-long, full-time required rotations. At least one rotation must be completed in an acute-care hospital setting and one in a community setting. Although each site will differ in terms of the patient population, disease acuity, scope of practice, resources, and availability of patient-specific data, students will take responsibility for drug therapy outcomes. Students will learn to: 1) collect and record patient-specific data; 2) identify, list, and assess drug-related problems; 3) develop and record pharmaceutical care plans; 4) educate patients and health care professionals regarding the appropriate use of drugs; and 5) measure and document patient outcomes. These activities are closely linked to PHPC 576 Ambulatory Clinic and concurrent with PHPC 577 Informational Services. Prerequisites: PHPC 570 and 571 and successful completion of the Integrated Science and Therapeutics course series.

PHPC 576—Ambulatory Clinic (1)

This series of required experiences is normally taken concurrently with the Pharmaceutical Care rotations (PHPC 572, 573, 574, and 575). A total of 16 half-day experiences is required, for a total of 64 hours. Following the pharmaceutical care model, students will conduct patient interviews, perform appropriate pharmacotherapy-oriented physical assessments, order appropriate laboratory tests, initiate and/or change drug therapy regimens and conduct patient follow-up. (Register Spring Semester, Fourth Year) Prerequisites: PHPC 570 and 571 and successful completion of the Integrated Science and Therapeutics course series.

PHPC 577—Informational Services (2)

This course must be taken concurrently with the Pharmaceutical Care rotations (PHPC 572, 573, 574, and 575). During the course of daily activities on Pharmaceutical Care and Ambulatory Clinic rotations, students learn how to receive drug information questions in a comprehensive manner, conduct timely and thorough literature searches, evaluate sources of information, and provide appropriate responses. Students are also expected to subscribe to an affordable abstracting service and develop a personal information library. (Register Spring Semester, Fourth Year) Prerequisite: Successful completion of PHAR 553.

DIDACTIC ELECTIVE COURSES

The elective didactic (PHMY) courses currently offered by the School of Pharmacy are described below. In general, higher course numbers indicate courses with important prerequisite requirements, and are designed for later years of the curriculum. Prerequisites for most electives include consent of the instructor and the student's advisor. Some electives are offered in either the fall or spring semesters, and some are offered both semesters. Refer to the class schedule when making course selections.

PHMY 510—Advanced Educational Opportunities (1)

This elective program provides students interested in graduate school or research careers with knowledge and information about various advanced educational opportunities in the curriculum. Aspects of careers which require advanced study are described by professionals in those career areas and by students currently enrolled in them. The course offers diverse perspectives on goals, training, functions, settings, and opportunities in research in pharmaceutical sciences and pharmacy practice.

PHMY 511—Diabetes Disease State Management (1)

This course will review the pathophysiologic changes associated with diabetes mellitus (Types I and II, impaired glucose tolerance, and gestational diabetes), nonpharmacologic management (nutrition and exercise), pharmacologic man-

agement, complications of diabetes mellitus, principles of education (children, adolescents, adults, and geriatrics), continuous care (skin and foot care, OTC product selection), blood and urine monitoring, special population considerations (children, adolescents, geriatrics, visually impaired patients), psychosocial aspects of diabetes (dealing with diagnosis, developing support strategies, and adherence to regimens), and how to set up a diabetes-focused practice. Prerequisite: Fourth-year status.

PHMY 512—Case Based Management of Infectious Diseases I (1)

PHMY 513—Case Based Management of Infectious Diseases II (1, 2)

These courses provide third- and fourth-year students and students in the Non-traditional Pathway with an opportunity to critically examine the clinical decisions made in the management of patients with infectious diseases. During the first course, students will review the therapeutic decisions made in the care of a patient encountered during an experiential course and review the literature relevant to those decisions. During the second course, students will present a case discussion, including a thorough review of the standard of care and the literature support for the decisions made. Prerequisites: Third-year status or PHNT 545 and 546.

PHMY 514—Teaching Preparation and Skills (1)

The course is a basic introduction to instructional activities in general and teaching at the University of Maryland School of Pharmacy in particular. The first two days consist of a series of presentations on teaching-related topics. The instructors will develop a short interactive lecture on diabetes management to demonstrate each aspect of the teaching and presentation development process. There will be frequent in-class activities requiring student interaction. During these, students will begin to develop their own topic for presentation on the last day of class. Teaching Preparation and Skills is an unusual modular course originally developed for nontraditional PharmD students. It was intended to improve their ability to make in-class presentations. However, since the ability to create and deliver a lecture or seminar is fundamental to many students and faculty members within the School, it is now frequently attended by graduate students and new faculty members. In addition to teaching participants how to make presentations in general, it focuses on using presentation technology available in the School of Pharmacy.

PHMY 516—Geriatric Imperative (2)

The Geriatric Imperative Minimester is a five-day interdisciplinary course open to all University of Maryland students during the first week in January. The course presents a wide range of information on the health and well-being of older adults through clinical, research, and policy presentations. Course content will be conveyed through lectures, panel discussions, team and case presentations, role play, video tapes, and site visits. Students will be required to write an in-depth

paper on a subject pertaining to geriatrics/gerontology within two months of completing the didactic portion of the course.

PHMY 517—Geriatric Pharmacotherapy (2)

This course provides advanced discussion of the geriatric diseases and different presentations of disease and responses to therapy. A case-based approach expands on previous geriatric coursework and allows students to apply material to different patient-care settings. Journal club and drug information questions are utilized to illustrate concepts. Prerequisite: Third-year status.

PHMY 518—Drug Abuse Education (1-3)

Practice and training in the dissemination of drug information, especially drug abuse information to the public, are linked to the activities of the Student Committee on Drug Abuse Education (SCODAE). Students complete a 10-hour training session, observe community education programs presented by SCODAE, present several programs, and prepare a written report on a timely topic in the area of chemical dependence.

PHMY 519—Controlled Drug Delivery (1)

This course aims at optimizing drug therapy by delivering bioactive agents at specific sites or at specific rates to patients.

PHMY 520—Organizational Behavior (3)

The study of the effects of human behavior on organizational effectiveness. Attention is given to quality, team work, attitude toward work, satisfaction and commitment, building and exercising organizational power, the role of leadership, sustaining motivation, participatory decision-making, and the process for change, development, and continuous improvement.

PHMY 521—Financial Reporting (3)

This course is a study of financial reporting, analysis and strategy principles applied to for-profit and not-for-profit health care organizations. Accounting issues related to strategic decision-making in health service production, financing, and investment will be emphasized throughout the course. Topics include the health care accounting environment, revenue and expense recognition, balance sheet valuations, ratio analysis, budgeting and control systems, cost accounting, performance measurement, variance analysis, cost-volume-profit relationships, and capital budgeting. Special attention is given to the financial implications of third-party payment systems and measuring the profitability of managed-care contracts.

PHMY 522—Business Plan Development (2)

An elective course for students interested in ownership or management of their own pharmacy practice, emphasizing the practical problems associated with establishing a new business or expanding an existing enterprise. Location and

market analysis, target marketing, revenue and expense projections, and estimation of capital requirements are among the topics covered.

PHMY 523—Advanced First Aid (3)

Advanced first aid and emergency care, including CPR.

PHMY 524—Marketing (3)

Marketing introduces methodologies for identifying changes in the organization's marketplace and adapting to them. The course uses the market-orientation concept, emphasizing customer needs, total integration of the firm, and the profit potential to examine the marketing process, and in doing so, will use pharmacy-based examples. Prerequisite: PHAR 545—Practice Management.

PHMY 525—Comprehensive Pediatric Care (2)

Comprehensive pediatric care is a two-credit course offered in the spring semester for third- and fourth-year students in the entry-level Doctor of Pharmacy Program. This elective course is designed to prepare students to optimize medicine use in pediatric patients in the ambulatory or institutional setting. The course will cover cognitive and physiological development, psychosocial factors affecting medicine use, pharmacist role, regulatory issues, and pediatric pharmacotherapy for various disease states.

PHMY 526—High Impact Presentations (2)

This elective course is designed to prepare students to be well-prepared and competent presenters and to clearly and succinctly convey their information through oral and visual presentations. Students will be required to describe the process used to prepare an effective presentation, select and develop the appropriate audio visual aids to enhance a presentation, assess the quality of a presentation and the quality of the skills used by the presenter, and plan and deliver a presentation that meets the needs of a specific audience, using appropriate audio-visual enhancements, and techniques to maximize learning and retention of educational content.

PHMY 529—Special Group Studies (1-5)

(Repeatable up to 12 credits) An omnibus course permitting experimentation with new or different subject matter and/or instructional approaches.

PHMY 529—Special/"I Can Cope": Pharmacy Educators in Pain Management (1)

This course prepares pharmacy students to serve as facilitators in the "I Can Cope" series developed by the American Cancer Society. Specifically, students will be taught how to facilitate a session on the module titled "Relieving Cancer Pain." Pharmacy facilitators will lead a class concentrating on the health challenges to wellness and quality of life imposed by cancer pain. An overview of pain, medical treatments to control pain, and nonmedical strategies are presented

to help empower participants and assist them to begin building a repertoire of self-care techniques.

PHMY 529—Special/Issues In Health-System Pharmacy (1)

This course will familiarize students with issues faced by health-system pharmacy. The student will learn the background and substance of the issues and approaches used in dealing with them. Areas covered will include medication use safety, automation/drug distribution, financial issues/outsourcing, communications, organization of corporate entities, leadership/management, and quality of services. Prerequisites: Phase I Experiential Learning Rotations.

PHMY 529 –Special/Women’s Health (3)

Using highly interactive education techniques, students will explore a broad range of health issues that women face throughout the life cycle as well as further develop their skills to evaluate patient-specific data, make appropriate therapeutic decisions, and design drug therapy monitoring plans. Specific issues/disorders to be discussed will include contraception, infertility, vaginal disorders, gestational diabetes, eclampsia, menopause, and osteoporosis. Prerequisites: For entry-level students: Completion of PHAR 554 and PHAR 555 (ISAT I and II). For non-traditional: Ccompletion of PHNT 545 or PHNT 555 I (Therapeutics I or II) and completion of PHNT 532 (Patient Assessment).

PHMY 537—Clinical Aspects of Drug Dependence (2)

This course familiarizes students with the clinical aspects of chemical dependence. Special emphasis is placed on the pharmacology of commonly abused psychoactive substances and the role of pharmacological supports in the treatment of addiction.

PHMY 539—Special Projects (1–3)

(Repeatable up to 12 credits) Independent investigations consisting of library or laboratory research, seminars, or other assignments appropriate to the problem investigated.

PHMY 541—Introduction to the Poison Center (1)

This course provides students the opportunity to observe and be involved in a clinically oriented pharmacy practice setting early in their education. Students learn about the Poison Center’s operation and resources and the potential for pharmacist participation in this area of patient care. The course consists of discussion sessions, activities in the Maryland Poison Center, role playing, and laboratory sessions focusing on toxicology resources and communication skills. Students present cases on a home-management and a hospital-management drug overdose.

PHMY 543—Honors Seminar in Pharmacy Administration (1)

A survey of current literature in the general area of pharmacy practice and administrative science. Each week, a recently published paper related to the economic,

social, behavioral, or educational aspects of pharmacy is discussed and evaluated. Special student research projects may also be undertaken.

PHMY 550—Adverse Drug Reactions (2)

Focus is on the clinical manifestations and incidence of drug reactions, systems affected, differentiation among idiosyncratic reactions, hypersensitivity reactions, extensions of pharmacologic action, and assessment of drug reaction literature.

PHMY 551—Recent Advances in Pharmacology (1)

The objective of this course is to present advances in pharmacology and toxicology. Sessions emphasize experimental and clinical findings and their interpretation and significance in relation to basic and applied aspects of pharmacology and toxicology. Attention is also given to experimental design and methodology of the studies in question.

PHMY 552—Pharmacology and Aging (1)

This course presents advances in our understanding of variations in drug response in the aging population. The course is designed to give students an appreciation for the basic physiological and biomedical changes which normally occur with aging and how these changes relate to altered pharmacodynamic and pharmacokinetic responses following drug administration. Basic and clinical pharmacologic studies are used to support the conclusions presented.

PHMY 553—Consumer Education Program for Older Adults (2)

This course trains students to educate the elderly about drugs and drug-taking. Students benefit from the didactic and applied aspects of the course, since they must first learn about the special needs of the elderly and then actually interact with the elderly both in large groups and one-on-one.

PHMY 554—Health Education Seminar (2)

The course prepares students to become effective health educators to patients, other health care practitioners, and/or the community. The theoretical and conceptual bases of the health education discipline are fully developed. Students learn the techniques of behavioral and educational diagnosis and their application to the development of educational intervention.

PHMY 556—Advanced Pharmacology I (2)

PHMY 557—Advanced Pharmacology II (2)

This course expands and extends the pharmacology material learned in the required courses PHAR 536 and 546. The course format is the discussion of assigned topics and review of original papers in a two-hour, weekly session. These sessions include graduate students in the pharmaceutical sciences.

PHMY 561—Advanced Therapeutics Seminar (3)

An advanced course dealing with complex drug therapy decision-making, using case presentations and current literature. Requires active student participation in resolution of therapeutic controversies.

PHMY 562—Clinical Pharmacokinetics (2)

The course will extend the student's knowledge of clinical pharmacokinetics, develop the student's skills in providing pharmacokinetic drug monitoring during PharmD rotations, and prepare students for post-graduate work in clinical pharmacology research. Emphasis is placed on the application of these principles to clinical practice and clinical research.

PHMY 563—Pharmacotherapeutic Issues in the Critically Ill Patient (2)

This course is an elective seminar for students interested in critical care pharmacotherapy. Topics include a broad scope of disease states and drug issues frequently encountered in an ICU setting. Presentations will identify the pharmacologic aims and controversies in the management of a particular topic, while simultaneously underscoring the complexities of drug therapy in the critically ill patient, which may lead to untoward reactions or suboptimal care.

PHMY 567—Advanced Cardiac Life Support (2)

This course focuses on the role of the pharmacist in the setting of cardiac arrest. A lecture format covers the pathophysiology, epidemiology, therapeutic goals, and treatment modalities in cardiac arrest as described by the Standards and Guidelines developed by the National Conference on Cardiopulmonary Resuscitation and Emergency Cardiac Care. Topics include the role of the pharmacist on the cardiac arrest team, an in-depth discussion of the role of pharmacologic intervention, techniques of basic and advanced cardiac life support, and post-resuscitative care.

PHMY 574—Pharmacotherapeutics I (2)

PHMY 575—Pharmacotherapeutics II (2)

Pharmacotherapeutics is a course in advanced therapeutic decision-making which parallels the therapeutic topics offered in the Integrated Science and Therapeutics modules during the third year of the curriculum. The course requires students to formulate therapeutic decisions based upon case materials and emphasize the process of decision-making in the presence of multiple patient and agent variables. As the number of cumulative therapeutic topics increases, the complexity of the decision-making increases. Students are expected to incorporate data from the primary literature as part of the therapeutic decision-making process.

PHMY 576—Advanced Topics in Pharmaceutics (2)

This course will allow students to become familiar with advanced topics in pharmaceutics. Different topics will be presented in the form of lectures, group discussions of original papers, and laboratories and will include bile acid

sequestrants, drug dissolution, production methods for inhalation aerosols, metered-dose inhaler formulation, tablet compaction, pellet drug delivery, critical formulation and manufacturing variables, oral drug absorption, and novel chemical approaches for targeted drug delivery. Prerequisites: PHAR 535—Pharmaceutics or concurrently enrolled in Pharmaceutics or consent of coursemaster.

PHMY 577—Pharmacoeconomics (3)

This course is designed to familiarize students with the economic structure, conduct, and performance of the pharmaceutical industry. The course includes such topics as prices and profit in the industry, productivity, costs, economies of scale, innovation, economic effects of regulation, and cost benefit and cost effectiveness analysis of pharmaceuticals. Prerequisite: One undergraduate course in economics or permission of instructor.

PHMY 580—Drugs and Public Policy (2)

An examination of public policy issues related to drug use in our society. Cases, small group discussions, and outside experts will be used to analyze contemporary issues affecting pharmacy and health care.

PHMY 581—Research Pathway Seminar (1)

The objective of this course is to provide an overview of pharmaceutical and other health- and life-science-oriented research by attending research seminars and participating in the discussion of those seminars.

PHMY 583—Management of Health Care Systems (3)

This course will familiarize students with the different practice settings in integrated health systems ranging from community pharmacies to managed care organizations and hospitals. Areas that will be covered include pharmacy benefits management, disease state management, information management, models of integrated health systems, management of the therapeutic process, negotiating and networking, and the response of pharmacy practice settings to the changes in these systems. Prerequisites: PHAR 523 Ethics, PHAR 545 Practice Management, PHPC 570 Safe Medication Order Processing in Community Pharmacy Rotation, and PHPC 571 Safe Medication Order Processing in Institutional Pharmacy Rotation.

PHMY 584—Patient Counseling (2)

Students will learn key information about the Top 100 prescribed drugs in the United States. The content will focus on information that needs to be communicated to patients concerning their therapy. This material will reinforce what students have learned in other courses. In addition, students will become familiar with new product-specific material that has not been addressed in the curriculum. Periodic quizzes will assess student knowledge. The Pharmacy Practice Laboratory will also be used to videotape students as they counsel simulated patients.

PHMY 585—Perspectives of Mental Health (2)

This course provides students with an understanding of the mental health system, discusses controversies that may face the practicing pharmacist, familiarizes students with tools and techniques for studying psychopharmacologic agents, and helps to define pharmacists' roles in providing mental health care.

PHMY 586—Journal Club (2)

This elective course is abilities-based, structured in a journal club format, and parallels second-year courses. The elective provides a forum in which students can practice and enhance oral and written communication skills, literature retrieval, and evaluation activities, while learning new information relating to ongoing required coursework. Students select articles from the primary, basic, or clinical research literature and lead discussions of the articles. The discussions include study design, informational content, and how articles relate to and enhance the topics of second-year courses the students are concurrently taking.

PHMY 587—Mammal Anatomy and Histology (2)

This advanced-level elective course provides students a structured opportunity for a major dissection of two mammalian species. Students observe the location and structure of all organs of the body and their relation to each other. Working in pairs at their own pace, students systematically dissect an adult, preserved cat and a pregnant rat. Prerequisite: PHMY 590 Fetal Pig Anatomy and/or consent of coursemaster

PHMY 590—Fetal Pig Dissection (1)

This elective course provides students the opportunity to dissect a mammalian species and observe the location and structure of most organs of the body and their relation to each other. Prerequisite: PHAR 514 Human Biology I and/or consent of coursemaster.

PHMY 591—Principles and Practice of Modern Compounding (2)

Using a combination of lectures, problem-solving workshops, and skill-building laboratories, this course teaches the appropriate extemporaneous compounding of drug preparations in pharmacies. Prerequisite: PHAR 535 Pharmaceutics.

PHMY 592—Clinical Toxicology (2)

The clinical toxicology course will provide students with an overview of the clinical manifestations, assessment and treatment of poisonings with common drug, chemical, and biological agents. The format includes lectures by faculty members, case assignments, and discussions led by students. Course evaluation includes the discussion sessions, a paper on students' choice of toxicology topic, a midterm, and a final exam. Prerequisite: Third-year status. Note: This course is highly recommended as preparation for PHEX 551 Poison Information Rotation.

PHMY 593—Care of the Terminally Ill (2)

This course prepares students to interact with terminally ill patients through increased understanding of the social and psychological aspects of death and dying as well as the palliative pharmacotherapeutic management of these patients. Prerequisite: Third-year status.

PHMY 594—Introduction to Community (2)

This course engages students in service-learning through work with the ENABLE Program, relating community needs in west Baltimore City to their future role as pharmacists. Prerequisite: PHAR 532 Longitudinal Pharmaceutical Care I.

PHMY 595—Complementary and Alternative Medicine (2)

This course explores the principles behind the botanical information and folklore uses of herbal remedies and provides an overview of alternative medicine as it is currently emerging. Alternative medicine therapies are also discussed: their rationale, safety, validity, and current therapeutic use.

PHMY 596—Nonprescription Medicine (3)

This course is designed to thoroughly familiarize the student with OTC medications. Emphasis will be placed on the pharmacology of these drugs, potential disease states in which the drugs will be used, self-administration techniques, consideration in selecting a product, triage issues, and patient counseling. Prerequisite: Third-year status.

PHMY 597—Bereavement (1)

This course addresses the skills and knowledge needed to serve bereaved individuals: the theory of attachment, loss, and grief, as well as how to effectively interact with the bereaved.

PHMY 598—Effective Leadership and Advocacy

This one-credit elective is offered to provide leadership and political advocacy development for students, including the officers of student organizations. Students are expected to be active participants in at least one of the School's student organizations. Students will examine leadership as they explore current health care issues and gain direct experience in the political process and community action.

EXPERIENTIAL LEARNING ELECTIVE COURSES

The experiential learning elective (PHEX) courses at the School of Pharmacy are described below. In general, experiential electives can be taken for either 2 or 3 semester hours of credit.

PHEX 540—Contemporary Pharmacy Practice (2, 3)**PHEX 541—Leukemial Bone Marrow Transplantation (2, 3)**

- PHEX 542—Neurology (2, 3)**
- PHEX 543—Developmental Disabilities**
- PHEX 550—Parenteral Nutrition (2, 3)**
- PHEX 551—Drug Information (2, 3)**
- PHEX 552—Poison Information (2, 3)**
- PHEX 559—Research (2, 3)**
- PHEX 560—Adult Internal Medicine (2, 3)**
- PHEX 561—Ambulatory Care (2, 3)**
- PHEX 562—Clinical Pharmacokinetics (2, 3)**
- PHEX 563—Administration Organizational Management (2, 3)**
- PHEX 564—Cardiology (2, 3)**
- PHEX 565—Critical Care/Shock Trauma (2, 3)**
- PHEX 567—Diabetes Education and Management (2, 3)**
- PHEX 570—Food and Drug Administration (2, 3)**
- PHEX 571—Surgery (2, 3)**
- PHEX 572—Geriatric Pharmacotherapy (2, 3)**
- PHEX 573—Home Health Care (2, 3)**
- PHEX 574—Infectious Disease (2, 3)**
- PHEX 575—HIV (2, 3)**
- PHEX 576—Medical Oncology (2, 3)**
- PHEX 578—Transplant (2, 3)**
- PHEX 579—Investigational Drugs (2, 3)**
- PHEX 581—Oncology Research (2, 3)**
- PHEX 582—Pediatrics (2, 3)**
- PHEX 583—Radiopharmacy/Nuclear Pharmacy (2, 3)**

PHEX 584—Chemical Dependence Treatment (2, 3)

PHEX 585—Chemical Dependence Research (2, 3)

PHEX 586—Veterinary Medicine (2, 3)

PHEX 587—Psychiatry (2, 3)

PHEX 588—Pharmacy Benefits Management (2, 3)

PHEX 589—Special (2, 3)

PHEX 590—Advanced Community Pharmaceutical Care (2, 3)

PHEX 591—Hospice (2, 3)

NONTRADITIONAL PHARMD (NTPD) PATHWAY

The NTPD Pathway requires 30 credits, including five credits of electives. Course numbers do not reflect prerequisite sequencing of courses.

**PHNT 500—General Principles of Pharmaceutical Care (3)
(Phased out Fall 2002)**

**PHNT 505—Prior Learning Assessment of Pharmacy Practice (2)
(Phased out Spring 2003)**

PHNT 511—Practice Management (4) (Final offering Fall 2003)

Practice Management is composed of four modules: financial management, principles of management, marketing, and managing pharmaceutical care services. These modules are designed to prepare students for the practice management experiential component and to build students' practice management abilities.

**PHNT 512—Principles of Pharmaceutical Sciences (2)
(Phased out Spring 2003)**

PHNT 521—Longitudinal Care (1) (Offered through Fall 2005)

This longitudinal experiential course focuses on assessing the health status of a cohort of patients in the student's own practice and participating in the management of pharmaceutical care needs of these patients during health transitions. It is expected that students commit a minimum of approximately 45 hours (e.g., an average of about three hours per week over a semester) to experiential activities in this course at their own practice site. Students are expected to apply skills from this course in subsequent pharmaceutical care experiential coursework.

PHNT 531—Practice Management Planning (2)
(Final offering Spring 2004)

Practice Management Planning will focus on the application of management principles to a pharmaceutical care service. The course will provide an opportunity for the student to develop a plan defining and justifying a pharmaceutical care service and an opportunity for implementing the plan.

PHNT 532—Patient Assessment Skills (1)
(Offered Fall 2003 and Summer 2004)

This experiential course focuses on the skills necessary to obtain general pharmaceutical care databases and problem-oriented databases from patients. Acquired skills include both history-taking and physical assessment. Learning experiences include faculty demonstrations, videos, simulations, and patient encounters. Students are expected to apply and practice skills from this course in the program's other experiential courses.

PHNT 534—Clinic or Institutional Assignment (1)
(Final offering Spring 2006)

Activities in this spring course include supervised development of pharmaceutical care plans, triage decision-making, discharge/transition planning, and patient counseling. Students are assigned to a total of 15 three-hour, faculty-supervised pharmaceutical care sessions outside their own practice setting.

PHNT 536—Drug Information Experience (1)
(Offered through Spring 2006)

Pharmacists will acquire and apply drug information skills in their own practice. Students will develop their own drug information library, access appropriate drug information databases, and utilize appropriate pharmaceutical and medical literature to prepare drug information reports. Assignments are made based upon the needs of the patients in the student's practice and the organizational needs of the practice site.

PHNT 545—Therapeutics I (3) (Offered Fall 2003 and Fall 2004)

This fall course focuses on common disease entities. Learning experiences include discussions of pharmacotherapy, case-study analysis, adverse drug reaction analysis, and development of care plans.

PHNT 546—Therapeutics II (3)
(Offered Spring 2004 and Spring 2005)

This spring course focuses on common disease entities and the development of pharmaceutical and other care plans for patients with these problems. Learning experiences include discussions of pharmacotherapy, case-study analysis, adverse drug reaction analysis, and development of care plans. Therapeutics I is not a prerequisite for Therapeutics II.

PHNT 547—Medical Information Analysis (1)
(Phased out Spring 2003)

PHNT 570—Pharmaceutical Care Experience (3)
(Final offering Spring 2006)

This course is designed to help practicing pharmacists build the skills needed to deliver pharmaceutical care services to patients. Students develop and implement triage or discharge plans and pharmaceutical care plans for a cohort of patients (in addition to the patients accumulated during the longitudinal care experience) in their own practice. Patients selected for plan development and implementation must have at least two pharmaceutical care problems. Students communicate these plans to other health care professionals, monitor the response of patients to these plans, make any necessary modifications, and assess patients' health outcomes. Students are expected to commit a minimum of 180 hours (an average of about 12 hours per week over the semester) to activities related to this course. During this course, students will be accountable for application of pharmacotherapy topics acquired through the didactic pharmacotherapeutics courses. Students completing this course will demonstrate the Nontraditional PharmD Pathway's terminal performance objectives related to the implementation of pharmaceutical care services in their practice site.

PHD PROGRAM COURSE DESCRIPTIONS

PHARMACEUTICAL HEALTH SERVICES RESEARCH

PHSR 610—Pharmacy, Drugs, and the Health Care System (3)

This course examines the principle components of the U.S. health care system, with special emphasis on their relationship to the provision of drugs and pharmacy services.

PHSR 620—Social and Behavioral Aspects of Pharmacy Practice (3)

The fields of medical sociology, psychology, social psychology, and interpersonal communication will be studied as they relate to the pharmacy practice system which involves patients, pharmacists, physicians, nurses, and other health care professionals.

PHSR 650—Pharmaceutical Economics (3)

This course is designed to familiarize the student with the economic structure, conduct, and performance of the pharmaceutical industry. The course includes such topics as prices and profits in the industry, productivity, cost, economies of scale, innovation, economic effects of regulation, cost benefit and cost effectiveness of pharmaceuticals, and efficiency of drug delivery systems. Prerequisite: One undergraduate economics course or permission of the instructor.

PHSR 670—Principles of Health Education, Health Promotion and Disease Prevention (3)

Health education is a scientific process designed to achieve voluntary behavioral changes to improve health status. Health promotion utilizes health education to promote health and prevent disease. The PRECEDE Model is used to demonstrate the analytical process to explore health problems and identify and assess the behavioral and non-behavioral factors associated with them in order to develop and evaluate interventions. This course addresses health education at the level of the individual, the family, and the community at large. Because the relationship between practitioner and patient is often a major determinant of outcome, health promotion in the clinical setting is given emphasis.

PHSR 701—Research Methodologies I (3)

This course is designed to introduce the student to the concepts of scientific research in pharmacy practice and administrative science. Topics to be discussed include the scientific method and problem-solving processes, social science measurement, and several specific methods of research. Co-requisite: Introduction to Biostatistics.

PHSR 702—Health Services Research (3)

This course is being revised and the new syllabus will be formalized by fall 2003. Prerequisite: Introduction to Biostatistics (multivariate regression) or permission of the instructor.

PHSR 704—Pharmacoepidemiology (3)

An introduction to the field of pharmacoepidemiology, which uses quantitative research methods to examine questions of benefit or risk in regard to the use of marketed medications. The course is intended to offer useful techniques to medical and health researchers who wish to assess the utilization, effectiveness, and safety of marketed drug therapies. Prerequisites: Introduction to Biostatistics and Introduction to Epidemiology.

PHSR 708—Special Problems (1-6)

This course involves students working with faculty members in numerous research or on a problem. Can be used to finish a cognate area with prior approval by curriculum committee. It can be undertaken for credit when initiated under the supervision of the student's research mentor or another faculty member. The student must register for PHSR 708. If the student opts to take that course, he or she should provide a one-page document which details the objective of the research and the deliverable expected from the project before the semester commences. This can be taken for a maximum of six credits per semester. Non-Dissertation Research Special Problems - used for all Cognate Areas.

PHSR 709—Graduate Seminar (1)

This course is a weekly seminar involving graduate students, department faculty, and participants outside the department. Must be repeated for a total of three (3) credits.

PREV 600—Principles of Epidemiology (3)

A comprehensive treatment of the concepts and methods of chronic disease epidemiology. Topics include the classification of statistical associations and the methods for distinguishing between causal and non-causal associations. Case-control, cohort, and experimental studies are considered in some detail. The course involves the presentation by students of epidemiological papers, including those linking lung cancer to cigarette smoking. Co-requisite/Prerequisite: PREV 620 or an Introduction to Biostatistics equivalent.

PREV 619—Computer-Aided Analysis of Research Data (2)

Provides the student with comprehensive experience in the application of epidemiological and biostatistical methods available in the Statistical Analysis System (SAS). Hands-on experience in weekly workshops is gained by conducting analyses of existing data designed to answer a research question. A third credit can be earned through a term project. Co-requisite/Prerequisite: PREV 620, previously or concurrently, and consent of instructor.

PREV 620—Principles of Biostatistics (3)

This course is designed to develop an understanding of statistical principles and methods as applied to human health and disease. Topics include research design; descriptive statistics; probability; distribution models; binomial, Poisson and normal distributions; sampling theory; and statistical inference. Prerequisite: Knowledge of college algebra required. Calculus recommended.

PREV 670—Psychiatric Epidemiology (2)

This elective critically reviews the methods and major substantive issues in psychiatric epidemiology. Topics include epidemiology of schizophrenia, depression, and dementia; and possible etiologic significance of socioeconomic status, stressful life events, social supports, crowding, and housing. Study designs used in conducting psychiatric epidemiological research are reviewed through lectures, seminars, and readings of current literature. Prerequisite: PREV 600 or consent of instructor.

PREV 700—Cardiovascular Epidemiology (3)

Is taught in a seminar format in which each student, with faculty guidance, chooses a current problem in cardiovascular epidemiology and, following a presentation of the problem, outlines an approach to the problem that is discussed in class. After incorporating relevant feedback, the student gives a formal presentation and submits a term paper that represents a comprehensive review of the topic. Prerequisite: PREV 600 or consent of instructor.

PREV 701—Cancer Epidemiology (3)

Is taught in a seminar format in which each student, with faculty guidance, chooses a current problem in cancer epidemiology and, following a presentation of the problem, outlines an approach to the problem that is discussed in class. After incorporating relevant feedback, the student gives a formal presentation and submits a term paper that represents a comprehensive review of the topic. Prerequisite: PREV 600 or consent of instructor.

PREV 720—Statistical Methods (4)

Course provides instruction on the specific statistical techniques used in the analysis of epidemiological data. Topics include treatment of stratified and matched data, detection of interaction, conditional and unconditional logistic regression, survival analysis, and proportional hazards models. Prerequisites: PREV 600, PREV 620, and consent of instructor.

PREV 749—Infectious Disease Epidemiology (3)

Consists of lectures, seminars, and reading assignments designed to promote an understanding of infectious disease epidemiology, with particular emphasis on modes of transmission (contact, contaminated vehicles, vector-associated, and airborne), interventions and approaches to disease control (smallpox, measles, typhoid, influenza, and hospital infections), infections of public health importance in Maryland, and use of the laboratory in infectious disease epidemiology. Prerequisite: PREV 600 and a basic knowledge of medical microbiology.

PREV 758—Health Survey Research Methods (3)

This course leads students through the steps in survey research, from developing and administering a survey questionnaire to analyzing the data. The final results of the survey are presented in a paper. Prerequisite: PREV 620 or consent of instructor.

PREV 801—Advanced Statistical Analysis (3)

This course includes maximum likelihood methods and likelihood ratio tests; topics in logistic regression analysis; Poisson regression analysis; survival analysis, including Cox proportional hazards modeling and parametric modeling; topics in matrix algebra; and longitudinal data analysis, including the multivariate linear model, profile analysis, growth curve analysis, GEE methods, and random effects models for repeated measures analysis. Prerequisites: PREV 619 and PREV 720 or consent of instructor.

PREV 803—Clinical Trials and Experimental Epidemiology (3)

This course presents a rigorous overview of the experimental method as applied in therapeutic evaluations and of causal associations between risk factors and clinical outcomes. The history of the experimental method and its clinical applications are studied in detail. Guest speakers of unique expertise and experience in

clinical trials also are drawn upon. Prerequisites: PREV 600 or equivalent; at least one semester of statistics, and consent of the instructor.

Food and Drug Law Seminar (3) UMB School of Law

This seminar considers the U.S. Food and Drug Administration as a case study of an administrative agency that must combine law and science to regulate activities affecting public health and safety. The class is designed both for students who expect to become involved in food and drug matters and for those who are interested in the interplay of law and science. Topics to be discussed may include: history of the U.S. Food and Drug Administration; food law, misbranding, and economic issues; nutritional policy and health claims; regulation of carcinogens, food additives, and color additives; drug regulation; drug approval process; breakthrough drugs and ethics of drug testing; medical device regulation; and regulation of biotechnology. Course requirements include a seminar paper, which may be written for certification.

Courses at Other University System of Maryland Institutions/ Schools

These courses may be taken in consultation with and with the approval of your advisor. See the appropriate university catalog or Web site for complete information regarding these courses.

UMBC = University of Maryland, Baltimore County
UMCP = University of Maryland, College Park

ECON 600—Policy Consequences of Economic Analysis (3) (UMBC)

ECON 601—Macroeconomic Analysis I (3) (UMCP)

ECON 601—Microeconomic Analyses (3) (UMBC)

ECON 603—Microeconomic Analysis I (3) (UMCP)

ECON 604—Microeconomic Analysis II (3) (UMCP)

ECON 605—Benefit-Cost Evaluation (3) (UMBC)

ECON 611—Advanced Econometric Methods I (3) (UMBC)

ECON 612—Advanced Econometric Methods II (3) (UMBC)

ECON 621—Quantitative Methods (3) (UMCP)

ECON 622—Quantitative Methods (3) (UMCP)

- ECON 623—Econometrics I (3) (UMCP)**
- ECON 624—Econometrics II (3) (UMCP)**
- ECON 626—Empirical Econometrics (3) (UMCP)**
- ECON 641—Economics of Government Policy Toward Business (3) (UMBC)**
- ECON 661—Macroeconomics of Public Finance (3) (UMBC)**
- ECON 661—The Corporate Firm (3) (UMCP)**
- ECON 662—Industry Structure, Conduct, and Performance (3) (UMCP)**
- ECON 663—Antitrust Policy and Regulation (3) (UMCP)**
- ECON 703—Advanced Macroeconomics I (3) (UMCP)**
- ECON 704—Advanced Macroeconomics II (3) (UMCP)**
- ECON 723—Time Series Econometrics (3) (UMCP)**
- POLI 610—American Political Institutions and Public Policy (3) (UMBC)**
- POLI 615—The American Political Arena (3) (UMBC)**
- POLI 625—The Theories of Public Administration (3) (UMBC)**
- POLI 626—The American Judiciary and Public Policy (3) (UMBC)**
- POLI 640—Health Law (3) (UMBC)**
- POLI 652—Politics of Health (3) (UMBC)**
- POSI 603—The Theory and Practice of Policy Analysis (3) (UMBC)**
- POSI 606—The Politics and Administration of Program Evaluation (3) (UMBC)**
- POSI 612—Ethics and Public Policy (3) (UMBC)**
- POSI 618—Issues in Health Care Finance and Service Delivery (3) (UMBC)**

- POSI 619—Organizational Behavior in Health Care Institutions (3) (UMBC)**
- PSYC 635—Community Psychology (3) (UMBC)**
- PSYC 645—Social Psychology (3) (UMBC)**
- PSYC 651—Cognitive Development (3) (UMBC)**
- PSYC 665—Drugs and Behavior (3) (UMBC)**
- PUAF 620—Political Analysis (3) (UMCP)**
- PUAF 640—Microeconomic Theory and Policy Analysis (3) (UMCP)**
- PUAF 641—Macroeconomic Theory and Policy Analysis (3) (UMCP)**
- PUAF 650—Normative Analysis (3) (UMCP)**
- PUAF 702—Regulatory Analysis (3) (UMCP)**
- PUAF 732—Welfare, Health Care and Affirmative Action (3) (UMCP)**
- PUAF 735—Health Policy (3) (UMCP)**
- PUAF 745—Human Health and Environmental Policy (3) (UMCP)**
- PUAF 671—Public Sector Finance (3) (UMCP)**
- SOCY 602—Intermediate Procedures of Data Analysis (3) (UMCP)**
- SOCY 651—Sociology of Health and Illness Behavior (3) (UMBC)**
- SOCY 652—Health Care Organization and Delivery (3) (UMBC)**
- 604—Biological Bases of Behavioral Development (3) (UMBC)**

ELECTIVE COURSES

POSI 607—Statistical Applications in Evaluation Research (3)
(UMBC)

PREV 619—Computer-Aided Analysis of Research Data (2)
(UMBC)

PUAF 754—Operations Research Methods for Policy Analysts (3)
(UMCP)

SOCY 630—Sociology of Aging (3) (UMBC)

SOCY 654—Comparative Health Systems (3) (UMBC)

SOCY 656—Comprehensive Health Planning for the Elderly (3)
(UMBC)

SOCY 670—American Social Institutions and the Aged (3)
(UMBC)

SOCY 671—Health and Related Social Conditions in Old Age (3)
(UMBC)

PHARMACEUTICAL SCIENCES

PHAR 600—Principles of Drug Design and Development I (1-3)

PHAR 601—Principles of Drug Design and Development II (1-3)

Describes the interrelationship among disciplines of the pharmaceutical sciences and establishes the basic theoretical background essential to the drug design and development process. Emphasizes ability development; content progresses, beginning with traditional drug design and optimization of drug structure, continuing with principles of pharmacology, pharmaceuticals, biopharmaceuticals, pharmacokinetics, and drug metabolism. Also covers integrative competency in the final module. This is a two-semester course divided into seven integrated modules. These modules relate the various disciplines within the pharmaceutical sciences to the drug design and development process.

PHAR 602—Biopharmaceutics/Pharmacokinetics (3)

Focuses on drug absorption, distribution, metabolism, and excretion coupled with dosage and the parameters of clearance, volume of distribution, and bioavailability. These processes determine the concentration of drug at the site of action in the body. Covers the quantitative relationship between dose and effect as a framework to interpret measurement of drug concentrations in biological

fluids, and pharmacokinetic principles using mathematical processes and descriptive parameters that describe the time course of drugs in the systemic circulation and the relationship of drug concentrations to observed effect.

PHAR 608—Introduction to Laboratory Research (1)

Students become familiar with research conducted by departmental faculty members. Rotations through the laboratory of a faculty member help students in their selection of a doctoral dissertation project. The rotation includes library work and an opportunity for participation in the experimental aspects of research. Students must take at least one laboratory rotation. Students meet with the chairs of all Research Focus Groups before selecting a rotation site.

PHAR 610—Pharmaceutical Formulation/Unit Processes (4)

Addresses the rational design and formulation of dosage forms, and the processes and equipment in their large-scale manufacture. Consideration is on how the interplay of formulation and process variables affects both the manufacturability of the dosage form and its performance as a drug delivery system.

PHAR 620—Modern Methods of Drug Delivery (3)

Focuses on the rationale for existing and future drug delivery systems. Students explore underlying physical, chemical, and biological basis for each system and identify benefits and drawbacks. Examples of delivery systems include inhalation aerosols, transdermal patches, microspheres, implants, and tablets. Emphasis is on the biopharmaceutics, and transport properties and barriers associated with each method of delivery. The course also stresses written and oral presentation skills through student presentations and paper critique sessions.

PHAR 628—Bioanalytical Separation Techniques (3)

Covers theory and applications of separation techniques used for low molecular weight compounds, such as most drugs, or for larger biopolymers, such as proteins and DNA. Also covers the separation of chiral compounds, and assay requirements and techniques for the sensitive and accurate measurement of drugs and metabolites in biological matrices, with emphasis on pharmacokinetics and biopharmaceutical applications.

PHAR 638—Pharmacometrics and Experimental Design (3)

Covers the theoretical and practical application of statistics and experimental design to help students use tools in research problems. The class discusses and uses computer programs to analyze data representing actual experimental situations.

PHAR 639—Spectrometric Methods of Pharmaceutical Analysis (3)

Introduces students to spectrometric techniques for the elucidation of molecular structure and to the analysis of pharmaceutically important materials. The methodologies covered include ultraviolet, visible, infrared, nuclear magnetic resonance, and mass and fluorescence spectrometry. The class includes discussions

of physical principles, instrumentation involved, exercises in the interpretation of spectrometric data, and examples of applications.

PHAR 648—Basic Techniques for Pharmacology Research (3)

Covers practical and theoretical aspects of basic pharmacology experimental methods. The course includes laboratory experiments to exemplify the techniques discussed in the lectures. Students write and submit reports in a selected pharmacology journal format. Topics include tissue culture, radioisotopes, signal transduction, radioligand binding, drug metabolism, protein and nucleic acid identification and quantification, electrophysiological, and in vivo techniques.

PHAR 653—Advanced Pharmacology I (4)

PHAR 654—Advanced Pharmacology II (4)

Pharmacodynamics is the study of the biochemical and physiological effect of drugs on biological systems. The course covers mechanisms by which pharmacological agents interact with the living organism to provide the student with a rational basis for investigations in biomedical research. Topics include the pharmacodynamics of drugs influencing the central and peripheral nervous system, and the endocrine, renal, respiratory, and cardiovascular systems. Lectures supplement weekly conferences and discussion groups.

PHAR 701—Theoretical Aspects of Liquid Dosage Forms (3)

Collates physical-chemical principles associated with liquid behavior used for pharmaceuticals. Emphasis is on the rationalization of behavior in terms of intermolecular forces. These forces manifest themselves as the cohesive forces within homogeneous liquid systems and interaction (adhesive) forces between phases. Solutions, suspensions, and emulsions are obvious examples of dosage forms whose formulation and analysis require a knowledge of the physical and chemical behavior of liquids. Fewer examples of the necessity for a foundation in liquid theory can be found on liquid-solid interactions: drying, absorption, filtration, wetting, and dissolution. Emphasis is on quantitative relationships in all areas. Students solve problems to apply these relationships to real systems to show their relevance and utility. This course provides background necessary for the design of experiments, the interpretation of results, and the promulgation of new theory regarding pharmaceutical systems that involve liquids.

PHAR 702—Theoretical Aspects of Solid Dosage Forms (3)

A survey of the performance and processing of solid dosage forms. As most pharmaceuticals are prepared from powders, emphasis is on identifying, measuring, and controlling those properties that decide the processing characteristics of powdered materials.

PHAR 708—Introduction to Pharmaceutical Sciences Seminar (1)

Includes presentations by graduate students, faculty members, and guest speakers. Students make an oral presentation on a preselected topic agreed upon by the

instructor. Topics include medicinal chemistry, pharmaceuticals, pharmacology and toxicology, and pharmacokinetics.

PHAR 709—Focus Group Seminar Series (1)

Presentation and critical review of progress in research and surveys of recent developments in pharmaceutical sciences.

PHAR 729—Principles of Drug Action (3)

Advanced study of the principles of drug action, carcinogenesis, immunology, the molecular view of pharmacology, and theoretical principles and practical applications of molecular modeling. A computer laboratory is associated with molecular modeling aspect.

PHAR 747—Advanced Pharmacokinetics (3)

A detailed study of the principles of drug transport, distribution, biotransformation, binding, and excretion, with emphasis on quantitative aspects and measurement of these processes.

PHAR 751—Drug Design (3)

Applications of chemical and biological principles to the rational design of drugs. Topics include targets of biologically active molecules, approaches to studying ligand and target interactions, overview of drug discovery, agents acting on specific targets, combinatorial chemistry, computation chemistry, and structure-activity relationships.

PHAR 801—Physical Pharmacy (3)

Covers aspects of physical chemistry that relate to pharmaceutical systems. It is a logical extension of PHAR 701, with a primary focus on disperse heterogeneous systems. The design or formulation of a dosage form involves the resolution of a particular set of problems. Pharmaceutical scientists in the industry involved with these activities must bring to each situation the basic skills necessary to address the set of problems. Students experience resolving problems in terms of basic principles. Topics include colloids, rheology, surface chemistry, emulsions, suspensions, complexation, and distribution phenomena.

PHAR 858—Special Topics (1-6)

Students examine an issue of pharmaceutical importance through readings, discussions, and limited investigations. The student and instructor decide the research problem and amount of credit before the start of the study.

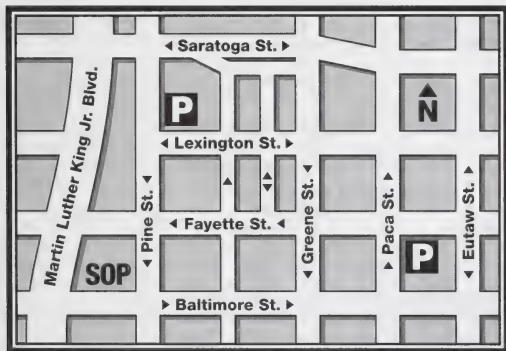
PHAR 899—Doctoral Dissertation Research (1-3)

TO REACH THE SCHOOL OF PHARMACY

School of Pharmacy
University of Maryland
20 N. Pine St.
Baltimore, MD 21201
410-706-7650
800-852-2988

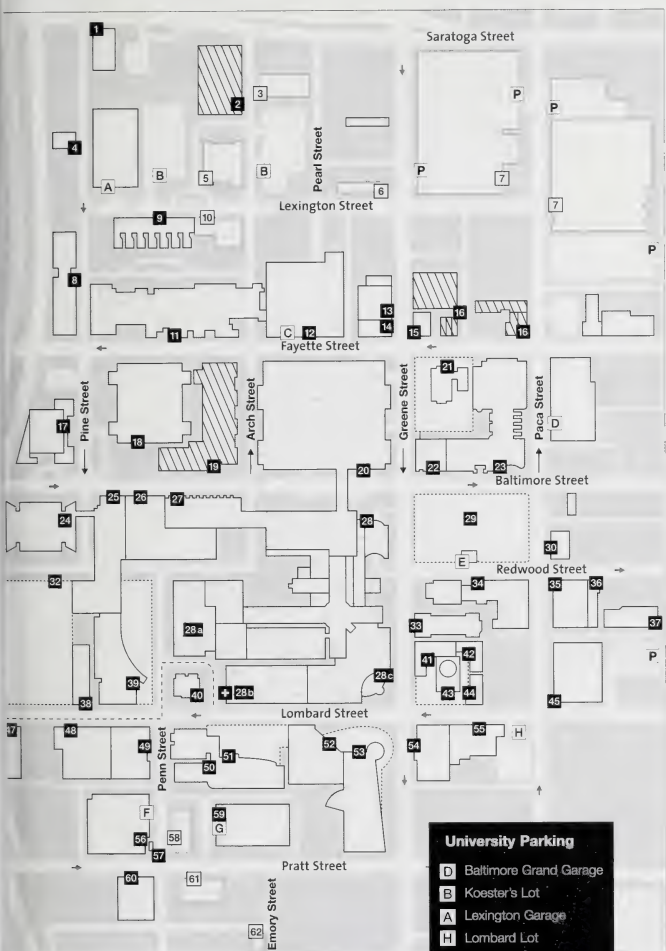
Directions

From I-95: Take 95 to exit Rte. 395 (downtown Baltimore) Martin Luther King Jr. Blvd. (MLK). Stay in the right lane after exiting onto MLK. At the fourth traffic light, turn right onto Baltimore Street. (The School is on the left at the corner of MLK and Baltimore Street.) Turn left at the 2nd traffic light onto Paca Street (get into right lane) and enter the Baltimore Grand Garage on your right. There is limited metered parking on the streets around the School.



Campus Map Index

- 47 Administration Bldg.**
737 W. Lombard St.
- 49 Allied Health Bldg.**
100 Penn St.
- 59 Athletic Center**
10th Floor, Pratt St. Garage
- 62 Babe Ruth Birthplace/
Museum**
216 Emory St.
- 63 Baltimore Convention Ctr.**
1 W. Pratt St.
- 52 Baltimore Student Union**
621 W. Lombard St.
- 13 Biomedical Research
Facility**
108 N. Greene St.
- 27 Bressler Research Bldg.**
655 W. Baltimore St.
- 46 Bromo Seltzer Tower**
312-318 W. Lombard St.
- 57 Community Outreach
Police Station**
700 W. Pratt St.
- 43 Davidge Hall**
522 W. Lombard St.
- 19 Dental School**
666 W. Baltimore St.
- 3 Downtown Child Care Ctr.**
237 N. Arch St.
- 41 Dr. Samuel D. Harris
National Museum of
Dentistry**
31 S. Greene St.
- 44 East Hall**
520 W. Lombard St.
- 38 Environmental Health
& Safety Bldg.**
714 W. Lombard St.
- 42 Gray Lab**
520 W. Lombard St. (rear)
- 33 Greene St. Bldg.**
29 S. Greene St.
- 18 Hayden-Harris Hall**
666 W. Baltimore St.
- 22 Hilda Katz Blaustein
Research Center**
550 W. Baltimore St. (Fis. 1 & 5)
- 25 Health Sciences Facility I**
685 W. Baltimore St.
- 39 Health Sciences Facility II**
700 W. Lombard St.
- 53 Health Sciences &
Human Services Library
(HS/HSL)**
601 W. Lombard St.
- 5 Hope Lodge**
636 W. Lexington St.
- 26 Howard Hall**
660 W. Redwood St.
- 37 James T. Frenkil Bldg.**
16 S. Eutaw St.
- 7 Lexington Market**
400 W. Lexington St.
- 55 Lombard Bldg.**
515 W. Lombard St.
- 6 Market Center Post Office**
130 N. Greene St.
- 15 Maryland Bar Center**
520 W. Fayette St.
- 61 Maryland Institute for
Emergency Medical
Services Systems**
653 W. Pratt St.
- 40 Maryland Pharmacists
Association**
650 W. Lombard St.
- 24 Medical School Teaching
Facility (MSTF)**
685 W. Baltimore St.
- 23 Nathan Patz Law Center/
Thurgood Marshall
Law Library**
500 W. Baltimore St.
- 64 Oriole Park at Camden Yards**
333 W. Camden St.
- 32 Old St. Paul's Cemetery**
- 12 Parking & Commuter
Services Office**
622 W. Fayette St.
- 9 Pascault Row**
651-665 W. Lexington St.
- 50 Pediatric Ambulatory Ctr.**
105 S. Penn St.
- 17 Pharmacy Hall**
20 N. Pine St.
- 8 Pharmacy Learning Center**
110 N. Pine St.
- 4 Pine St. Police Station**
214 N. Pine St.
- 10 Ronald McDonald House**
635 W. Lexington St.
- 2 Saratoga Garage**
220 N. Arch St.
- 1 Saratoga St. Transfer
Station**
663 W. Saratoga St.
- 51 School of Nursing**
655 W. Lombard St.
- 34 School of Social Work**
525 W. Redwood St.
- 58 State Medical Examiners
Building**
111 Penn St.
- 48 UM Biotechnology Institute**
721 W. Lombard St.
- 45 UM Family Medicine**
29 S. Paca St.
- 56 UM Women's Health**
120 Penn St.
- 28 UM Medical Center (UMMC)**
22 S. Greene St.
- 28c Homer Gudelsky Bldg.**
Lombard & Greene Sts.
- 28a Shock Trauma Center**
Lombard & Penn Sts.
- 28b Weinberg Building**
Lombard St.
- 35 UM Professional Bldg.**
419 W. Redwood St.
- 29 University Plaza**
- 30 University Square Bldg.**
11 S. Paca St.
- 16 University Suites at UMB
Tower**
518 W. Fayette St.
- 20 Veterans Affairs
Medical Center**
10 N. Greene St.
- 11 Walter P. Carter Center**
630 W. Fayette St.
- 21 Westminster Hall**
529 W. Fayette St.
- 31 1st Mariner Arena**
201 W. Baltimore St.
- 14 100 N. Greene St.**
- 54 111 S. Greene St.**
- 36 405 W. Redwood St.**
- 60 701 W. Pratt St.**



University Parking

- D** Baltimore Grand Garage
- B** Koester's Lot
- A** Lexington Garage
- H** Lombard Lot
- C** Pearl Garage
- F** Penn St. Garage
- G** Pratt St. Garage
- E** University Plaza Garage

visit www.umaryland.edu/map for an online version of the campus map.



UNIVERSITY OF MARYLAND
SCHOOL OF PHARMACY

20 North Pine Street
Baltimore, Maryland 21201
410-706-7650
800-852-2988

www.pharmacy.umaryland.edu

2005-2007
Catalog



2005-2007 Catalog

Doctor of Pharmacy (PharmD) Program
Pharmaceutical Health Services Research
Doctor of Philosophy (PhD) Program
Pharmaceutical Sciences Doctor of
Philosophy (PhD) Program

School of Pharmacy

University of Maryland
20 N. Pine St.
Baltimore, MD 21201-1180

PROGRAM INFORMATION

PharmD Admissions Office

Phone:

410-706-7653 or
800-852-2988 (Toll Free) (TTDY)

E-mail:

pharmdhelp@rx.umaryland.edu

Web Site:

www.pharmacy.umaryland.edu/admissions

Nontraditional PharmD Pathway Information

410-706-0761

Pharmaceutical Health Services Research (PhD) Program

410-706-7613

Pharmaceutical Sciences (PhD) Program

410-706-0549

Student Affairs

410-706-7653

Dean's Office

410-706-7650

University Financial Aid Office

410-706-7347

Development Office/Alumni Association

410-706-5893

School Web Site

www.pharmacy.umaryland.edu

The University of Maryland is accredited by the Middle States Association of Colleges and Schools. The School of Pharmacy's Doctor of Pharmacy (PharmD) and continuing education programs are accredited by the American Council on Pharmaceutical Education. For additional information, write ACPE, 311 W. Superior St., Chicago, IL 60610 or call 312-664-3575. The School is a member of the American Association of Colleges of Pharmacy.

The School reserves the right to make changes in requirements for admission, curriculum, standards for advancement and graduation, and rules and regulations.

NOTE: Notwithstanding any other provision of this or any other University publication, the University reserves the right to make changes in tuition, fees and other charges at any time such changes are deemed necessary by the University and the University System of Maryland Board of Regents.

The University of Maryland School of Pharmacy is committed to providing equal education and employment opportunity in all of its programs.

The University and the School of Pharmacy do not discriminate on the basis of race, color, religion, age, ancestry or national origin, gender, sexual orientation, physical or mental disability, marital status, or veteran status. Exceptions are as allowed by law, for example, due to bona fide occupational qualifications or lack of reasonable accommodations for disabilities.

Produced by the University of Maryland Office of External Affairs, 2005.

2005-2007 CATALOG

UNIVERSITY OF MARYLAND
SCHOOL OF PHARMACY

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MESSAGE FROM THE DEAN



Drugs play a key role in modern health care to help people get and stay well. Pharmacy is the profession that works with patients and their physicians to make the best use of medications. The University of Maryland School of Pharmacy offers several programs to prepare individuals for the

practice of pharmacy or for independent basic or clinical research. Whether you are interested in becoming a pharmacist, obtaining a residency in pharmacy practice or a clinical specialty, or pursuing graduate studies in the pharmaceutical sciences, pharmaceutical health services research, or the clinical sciences, the excellent faculty members at the School are here to help you learn.

Our Doctor of Pharmacy (PharmD) program emphasizes problem solving and critical thinking and qualifies the graduate for national and state licensing exams. Maryland students learn to practice as patient-oriented healthcare professionals who will work as part of an interdisciplinary team. The curriculum is innovative and flexible. PharmD students can choose from many electives, explore pathways that focus on areas of interest, and seize opportunities to work closely with members of our large and excellent faculty. To round out their education, students elect practice rotations from among hundreds of preceptors working in every imaginable setting in which pharmacy is the focus.

In addition to our PharmD program, we offer graduate programs in Pharmaceutical Sciences and Pharmaceutical Health Services Research. Our PhD students develop the knowledge and skills necessary to conduct independent research. Our graduates go on to direct the discovery, development, and delivery of medications for safe and effective therapy as well as to improve pharmaceutical outcomes and geriatric care. They find careers in academia, the pharmaceutical industry, and government institutions.

The mission of the University of Maryland School of Pharmacy is to enhance health through innovation and excellence in pharmaceutical education, research, practice, and public service. It is our vision to lead the way in advancing the profession of pharmacy. Our graduates are proud to be known as *Maryland Brand Pharmacists*. This catalog serves as a starting point and a reference for information about the University of Maryland School of Pharmacy. It was published in the fall of 2005. To make sure you have the very latest information on the School of Pharmacy, consult our Web site at www.pharmacy.umaryland.edu. You will find not only the latest catalog information, but also news and other features about our School.

A handwritten signature in black ink that reads "David A. Knapp". The signature is written in a cursive, flowing style.

David A. Knapp, PhD

Dean

University of Maryland School of Pharmacy

SCHOOL OF PHARMACY

HISTORY

The University of Maryland School of Pharmacy has a rich and distinguished heritage. First incorporated as the Maryland College of Pharmacy on January 27, 1841, it is one of the oldest pharmacy schools in the country. Primarily an independent institution until 1904, the Maryland College of Pharmacy then became the Department of Pharmacy of the University of Maryland. In 1920, the University of Maryland in Baltimore merged with the Maryland State College at College Park to form the State University. Today, the School of Pharmacy is one of six professional schools and a graduate school that comprise the University of Maryland in downtown Baltimore.

Throughout its history, the School of Pharmacy has been a local and national leader for the profession of pharmacy. It was a founding member of the American Association of Colleges of Pharmacy, the national organization of faculty and schools and colleges of pharmacy. The School was also instrumental in the formation of the Accreditation Council for Pharmacy Education, the national accreditation organization for educational programs in pharmacy.

In 1970, through the efforts of the School and the Maryland Board of Pharmacy, Maryland became the first state to replace unstructured internships with a professional-experience program incorporated in a school's curriculum, setting a national standard for professional pharmacy education. In 1993, the School again set the pace for curriculum reform by adopting a four-year Doctor of Pharmacy program as its sole professional educational program. The PharmD is now the required program in all schools and colleges of pharmacy nationwide.

The University of Maryland School of Pharmacy is a comprehensive institution, offering not only the Doctor of Pharmacy degree, but also post-PharmD residency and fellowship opportunities, two Doctor of Philosophy programs training independent scientists, and a variety of dual degree programs with law, business and the pharmaceutical sciences. The School's research program in pharmaceutical health services and pharmaceutical sciences is at the cutting edge of scholarly advances. A wide range of clinical service programs provides excellent pharmaceutical care to patients. Community outreach programs touch thousands of individuals through the Maryland Poison Center, The Peter Lamy Center for Drug Therapy and Aging, the Drug Information Center, and the Office of Substance Abuse Studies.

The University of Maryland School of Pharmacy not only prepares future generations of *Maryland Brand Pharmacists*, it also reaches out to the community every day, and engages in scholarship that will contribute mightily to the health and well-being of society.

MISSION

We enhance health through innovative pharmaceutical education, research, practice, and public service.

VISION

We lead the way in advancing the profession of pharmacy.

In our innovative educational, research, and practice settings, students gain the knowledge and skill to excel in a variety of pharmaceutical careers. Employing a spirit of discovery fostered during the course of their studies, our graduates are leaders wherever they practice, conduct research, or teach. They are essential contributors in the dynamic health care arena meeting the need for pharmacists within the state of Maryland and beyond.

As a top-5 research school, we apply an integrative understanding of drug discovery, development, and utilization in conducting groundbreaking and translational research. The outcomes from this research make a major impact on the quality and longevity of people's lives.

We are a formidable influence in shaping drug policy and pharmaceutical practice. Our community service programs bring education and care to people in Baltimore and throughout the state. These endeavors, coupled with our national and international collaborations, improve the effectiveness of pharmaceutical care throughout the world.

Our faculty, staff, and students create and sustain a welcoming and supportive environment where people develop professionally and use their knowledge and talents to realize this vision.

ADMINISTRATIVE OFFICES

ACADEMIC AFFAIRS

The Office of Academic Affairs provides leadership and administrative management in all professional education programs. The associate dean for academic affairs provides oversight of professional curricula, including pathways, experiential learning, and joint degree programs, and is responsible for: scheduling, educational technology, appointment of graduate teaching assistants, liaison with other academic units of the University, and continuing professional education. The associate dean for academic affairs is also responsible for program assessment and meets with the Educational Advisory Committee, composed of members of the external professional pharmacy community, to identify and discuss important issues affecting the educational programs at the School and to provide advice on those issues. Also, this associate dean coordinates initiatives in the international arena that deal with pharmacy education. The School's Student Discipline and Grievance Committee handles issues surrounding academic integrity and student behavior.

FINANCE AND ADMINISTRATION

Under the direction of the associate dean for administration and finance, the Office of Administration and Finance provides leadership and oversight of basic infrastructure support services necessary for the School to carry out its mission. For more information call 410-706-7651. The following units fall under this division of the dean's office:

- *Computer and Network Services*
Responsible for the operation, planning, and maintenance of the School's computer systems and network.
- *Facilities and Laboratory Support Services*
Responsible for maintenance of public areas, classrooms and common laboratory equipment and for internal relocations, renovations and new construction. Assists with security and environmental health and safety issues.
- *Integrated Business Services*
Responsible for human resources, payroll, external reporting, budgeting and business/financial services for the School.

- *Dean's Office Staff*
Supports the dean and daily operations of the dean's office, including event coordination, room scheduling, support of academic affairs and special projects.

STUDENT AFFAIRS

The Office of Student Affairs provides a variety of services to enhance the student learning experience and to support students during their academic career. The Office of Student Affairs is under the direction of the associate dean for student affairs, the assistant dean of student services, four professional staff and an administrative assistant. The office is responsible for recruitment, admission, academic progression, and graduation of PharmD students and is involved with veteran affairs, financial aid, student leadership development, counseling programs and the operations of the experiential learning program. Other services include personal counseling, advising and tutoring systems, career development, and special programs, such as the White Coat Ceremony and Open House. For more information about the Office of Student Affairs, see www.pharmacy.umaryland.edu/studentaffairs/.

DEVELOPMENT/ ALUMNI ASSOCIATION

The Office of External Affairs is responsible for identifying and raising funds from private sources to include individuals, corporations and foundations. Working closely with the dean, the Board of Visitors, alumni, and faculty, fundraising efforts are focused on garnering support for student scholarships, faculty enhancements, and strengthening academic programs by increasing endowments and discretionary funds through annual, special, major, and planned gifts. The School of Pharmacy is very proud to recognize donors who contribute \$1,000 or more annually through the David Stewart Associates, the major giving club for alumni, friends, and faculty members. This office also provides school-based support to the Alumni Association as it plans the Graduation Banquet, Reunions and other activities to promote the School to its constituencies.

The mission of the School of Pharmacy Alumni Association is to strengthen and enhance the School by fostering communications, social interactions, and a sense of pride in the School and the profession. The Alumni Association provides a compli-

mentary and lifetime membership to each graduate of the School of Pharmacy upon matriculation.

Each year, the association sponsors a spring banquet honoring the graduating class and the 50-year class. In 2005, the Alumni Association, in conjunction with the School of Pharmacy, initiated the Alumni/Preceptor Awards Banquet to recognize the outstanding volunteer efforts of alumni and friends whose contributions directly impact the richness of the student experience and the professional legacy the School of Pharmacy enjoys. The Alumni Association participates in the student admissions process and in the School's fund-raising activities, offers networking opportunities to alumni and students, and awards eight academic scholarships to deserving students per academic year. For more information, visit the Alumni and Friends Web site at www.pharmacy.umaryland.edu/alumni/.

MARKETING AND COMMUNICATIONS

The manager of marketing and communications is responsible for producing School and alumni publications and for disseminating to the public relevant news and information regarding the activities of its faculty, students, and alumni.

DEPARTMENTS

PHARMACEUTICAL HEALTH SERVICES RESEARCH

The Department of Pharmaceutical Health Services Research's mission is to improve health among diverse populations through health services and other drug-related research, education, service and community outreach. Helping the department reach its goals are the Center on Drugs and Public Policy; The Peter Lamy Center for Drug Therapy and Aging; Enhancing Neighborhood Action By Local Empowerment (ENABLE); Pharmaceutical Research Computing; and the Office of Substance Abuse Studies. (See descriptions under Centers and Resource Programs in this catalog.) Additionally, the department values excellence in teaching, research, service, and the contributions of its members to the department, School, University, state, profession, and health care community. For more information about the Department of Pharmaceutical Health Services Research, see www.pharmacy.umaryland.edu/phsr/.

PHARMACEUTICAL SCIENCES

The mission of the Department of Pharmaceutical Sciences is to advance the field of pharmaceutical science through state-of-the-art research and discovery in the areas of cellular and chemical biology, neuroscience, pharmacology, and biopharmaceutics and drug delivery. This multidisciplinary research develops new methodologies for drug discovery that identify targets for drug development, develops new pharmacotherapeutic agents, and develops and optimizes new drug delivery systems. Pharmaceutical Sciences is committed to the innovative education of graduate and professional students through a scientifically integrated program to become outstanding pharmaceutical scientists and pharmacists. Furthermore, the department is committed to serve the needs of the School, University, and community. For more information about the Department of Pharmaceutical Sciences, see www.pharmacy.umaryland.edu/psc/.

PHARMACY PRACTICE AND SCIENCE

The Department of Pharmacy Practice and Science promotes the health and well-being of the public by advancing the practice of pharmacy and generating and disseminating new knowledge related to pharmacy practice and drug use. The department approaches these goals by: 1) preparing professional students, graduate students, residents, fellows, and pharmacists for the future through a variety of academic, training, and mentoring programs; 2) providing an environment conducive to the development of faculty and staff; 3) furnishing expertise, support, and leadership to professional, governmental, community, and health-related organizations and agencies; 4) fostering research into the clinical and social sciences related to pharmacy practice and drug use; 5) encouraging the development of new and innovative pharmacy practice and role models; and 6) providing a structure that supports these efforts. The department values excellence in teaching, practice, research, and service, and the contributions of its faculty and staff to the department, School, University, state, profession, and health care community. For more information about the Department of Pharmacy Practice and Science, see www.pharmacy.umaryland.edu/ppps/.

LECTURE SERIES

The School supplements its regular curriculum with the following special lectures and symposia:

- **Francis S. Balassone Memorial Lecture**
The Maryland Pharmacists Association, the School of Pharmacy Alumni Association, and the School sponsor this lectureship as a memorial to Francis S. Balassone. He was a 1940 graduate of the School, a past president of the Alumni Association, a distinguished former faculty member, and a past president of the National Association of Boards of Pharmacy.
- **Dean's Colloquium**
The Dean's Colloquium brings together students, faculty members, and nationally recognized scientists and clinicians to discuss contemporary issues of relevance to pharmacy and health care. These seminars provide unusual opportunities for interaction and exchange of new information on topics related to pharmacy practice and science.
- **Andrew G. DuMez Memorial Lecture**
This lectureship was established in 1969 by Mrs. DuMez in memory of her husband, Dr. Andrew G. DuMez, Dean of the School of Pharmacy from 1926 to 1948. Dr. DuMez was a distinguished educator and leader in pharmacy in Maryland, the United States, and around the world.
- **Ellis S. Grollman Lecture in Pharmaceutical Sciences**
Mrs. Evelyn Grollman-Glick funded a lecture program in memory of her brother, Ellis Grollman, in 1983. He was a 1926 graduate of the School. Each year a nationally recognized researcher in the pharmaceutical or related basic sciences is invited to present this lecture.
- **Peter P. Lamy Lecture**
The Peter P. Lamy Lecture was inaugurated in 1992 in recognition of Dr. Lamy's career as an internationally recognized authority on geriatrics and gerontology. This lecture provides an opportunity for pharmacists to discuss critical issues in the care of the nation's elderly.
- **Paul A. Pumpian Lecture Fund**
This lectureship was established in 1993 by Mr. Pumpian, a former professor at the School. The lecture brings distinguished leaders to the School to discuss health care policy issues affecting the nation.

ENDOWED CHAIRS

The School has the following endowed chairs:

- The **Emerson Professorship in Pharmacology** was endowed in 1927 as a chair in Biological Testing and Assay by Captain Isaac Emerson, president of the Emerson Drug Company. The first chair was filled by Dr. Marvin Thompson, a pharmacologist at the Food and Drug Administration at the time. Dr. Clifford W. Chapman, a pharmacologist from the Canadian National Laboratories, was appointed to the chair in 1938. Dr. Casimer Ichniowski and Dr. Naim Khazan were the third and fourth appointees to the chair. In 1988, Dr. Gerald M. Rosen was appointed Emerson Professor. Dr. Rosen's appointment as Emerson Professor led to his being named an Eminent Scholar by the Maryland Higher Education Commission.
- The **Evelyn Grollman-Glick Professorship in the Pharmaceutical Sciences** was established in April 2003 through the bequest of the late Evelyn Grollman. In 1983, Evelyn Grollman established a Lecture Fund in honor of her brother, Ellis Grollman, a 1926 graduate of the School. The endowed professorship will be used to recruit an eminent pharmaceutical scientist to further strengthen the School's research program.
- The **Parke-Davis Chair in Geriatric Pharmacotherapy** was established in 1990 with a \$1 million gift from the Warner-Lambert Co. on the eve of the 125th anniversary of Parke-Davis and the School of Pharmacy's 150th anniversary. The endowment underwrites the School's continuing commitment to geriatric pharmacotherapy as exemplified by the accomplishments of the late Peter P. Lamy, the first holder of the Parke-Davis Chair. Dr. Bruce C. Stuart is current holder of this chair.
- The **Ralph Shangraw/Noxell Endowed Chair in Industrial Pharmacy and Pharmaceutics** is named for the late professor of pharmaceutics Ralph F. Shangraw, who served on the faculty of the University of Maryland School of Pharmacy during his entire career. He not only was an internationally recognized pharmaceutical scientist, he was also a dedicated teacher who was one of the first to be honored by the American Association of Colleges of Pharmacy as a Distinguished Educator.

RESEARCH AND SERVICE CENTERS

- The **Center on Drugs and Public Policy (CDPP)** contributes to informed debate of drug policy issues in our society. CDPP research and educational programming has provided thought-provoking analysis and focused dialogue on drug use and public policy since 1987. The CDPP specializes in providing credible, unbiased, and pragmatic solutions for government agencies, the pharmaceutical industry, professional organizations, and private businesses on public health issues and practices involving medication use and regulatory matters. For more information, see www.pharmacy.umaryland.edu/cdpp/.
- The **Computer-Aided Drug Design (CADD) Center** was created to foster collaborative research between biologists, biophysicists, structural biologists and computational scientists at the University of Maryland, Baltimore, and beyond. The major goal of the CADD Center is to initiate these collaborations leading to the establishment of research projects to discover novel chemical entities with the potential to be developed into novel therapeutic agents. For more information, see www.pharmacy.umaryland.edu/cadd/.
- The **University of Maryland Drug Information Center (UMDI)** The mission of the UMDI is to provide comprehensive medical information to not only contract affiliated institutions, but also to the general public. The provision of service includes but is not limited to, patient-specific and adverse drug reaction consultations, guidelines for use, formulary monograph/review preparation and management, and newsletter support. The UMDI and its staff are also charged with the education of UMB pharmacy students in the practice of medical literature analysis. Students are educated on the proper utilization of online databases and search strategies in the hope of making them more proficient in the assimilation of information. The UMDI also participates in an ongoing Internet Drug Information Service, which provides World Wide Web users the ability to submit questions to qualified, trained, pharmacy staff. These questions are not limited in any way to geographic region or subject. The UMDI answers each question on an individual basis, usually within three business days, many within hours. For more information, see www.pharmacy.umaryland.edu/umdi/.
- The **Maryland Poison Center** is certified by the American Association of Poison Control Centers (AAPCC) as a regional poison center providing poisoning triage, treatment, education, and prevention services to all Marylanders. This service is staffed by pharmacists and nurses, who have specialized clinical toxicology training, 24 hours a day, every day of the year. All of our specialists have been certified by the AAPCC as Specialists in Poison Information. The mission of the Maryland Poison Center is to decrease the cost and complexity of poisoning and overdose care while maintaining and/or improving patient outcomes. We are continuing to work toward this mission by conducting research on the management of poisoning and overdose patients, through public education to try to prevent poisonings from occurring, by training health professionals (pharmacists, nurses, physicians, paramedics) in the management of poisoning and overdose care, and by working with the public health infrastructure in Maryland to help recognize poisoning challenges and working to respond to those challenges. For more information, see www.mdpoison.com/.
- The **Center for Nanomedicine and Cellular Delivery** was designed to create a multidisciplinary environment that will provide expertise and foster collaborations for the design, development and translation into clinic of nanosystems for use as therapeutic and diagnostic purposes. The use of nanotechnology in medicine is termed nanomedicine. Such systems can increase the efficacy and decrease toxicity of drugs. Expertise of faculty members of the center include chemistry, engineering, pharmaceutical sciences and drug delivery, and clinical research. The center provides research and educational opportunities for students, faculty and the larger scientific community in the emerging area of nanomedicine. For more information, see www.pharmacy.umaryland.edu/nanomedicine/.

- The **Peter Lamy Center for Drug Therapy and Aging** serves as the focal point for geriatric research, education, and service within the University of Maryland School of Pharmacy. The center is dedicated to improving drug therapy for aging adults through innovative research, education, and clinical initiatives. The center produces new scientific knowledge with practical applications for improving outcomes of pharmaceutical care for elderly patients. The center provides students, practitioners, and other caregivers with up-to-date and accessible information on best practices in geriatric pharmacotherapy. The center also works to strengthen the tie between education and practice by giving faculty members and pharmacy residents opportunities to apply principles of pharmaceutical care to older patients in various settings. For more information, see www.pharmacy.umaryland.edu/lamy/.
- The **Pharmaceutical Research Computing (PRC)** is a research center within the Department of Pharmaceutical Health Services Research in the University of Maryland School of Pharmacy. The staff is a group of highly skilled professionals in the fields of information technology, statistics, and pharmacy. Together, they strive to provide quality research support for faculty, post-doctoral fellows, graduate students and other researchers with data warehousing and analysis needs. PRC is self-supported by revenues generated from the services it provides. For more information, see www.pharmacy.umaryland.edu/prc/about.htm.
- The **Office of Substance Abuse Studies (OSAS)** was founded in 1986. The mission of the Office of Substance Abuse Studies at the University of Maryland School of Pharmacy is to improve programs of substance abuse treatment and prevention and to explore the intersection of substance abuse and pharmacy practice in our society. For over 20 years OSAS has been providing education, research, and service programs in the field of substance abuse for health professionals and the community at large. The OSAS sponsors the Student Committee on Drug Abuse Education and its quarterly newsletter *PharmAlert*. For more information, see www.pharmacy.umaryland.edu/~osas/.

RESOURCE PROGRAMS

- The **Biomedical Chemistry NMR Center** houses a GE 300 MHz nuclear magnetic resonance spectrometer. The superconducting magnet, the heart of the instrument, is permanently immersed in a vacuum-jacket reservoir of liquid helium (-260°C) and allows the detection and accurate determination of protons, ^{13}C , ^3P and other nuclei of biological importance. The NMR was the first instrument of its kind on campus, and it opened up many new avenues of research within the School, greatly increasing the number of inter-school collaborative ventures. For more information, see www.pharmacy.umaryland.edu/psc/nmr/.
- The **ENABLE (Enhancing Neighborhood Action By Local Empowerment) Community Health Workers Program** recruits and trains community residents to be Community Health Workers (CHWs). They receive intense training in chronic illness, case management, resource identification, and community outreach. Once trained, they are placed in local clinics and schools, identify clients in need, win their clients' trust, identify their symptoms, teach them preventive measures, and make sure clients keep regular doctors' appointments and follow treatment regimens. The mission of ENABLE CHW is to serve community residents, to enable them to improve their health outcomes through home-based individual care, case management, education, monitoring, and follow-up. For more information, see www.oca.umaryland.edu/gov/community/programs/pharmacy.html#1.
- The **Mental Health Program** of the School of Pharmacy is a joint venture with the Developmental Disabilities Administration and Mental Hygiene Administration of the state of Maryland. Its primary goals are to improve and maintain all aspects of pharmacy practice within the state's mental health facilities and provide leadership in the field of psychiatric pharmacotherapy for state programs and facilities. The program also serves as a site for pharmacotherapeutic and administrative research in mental health, a testing ground for innovative strategies in mental health pharmacy practice and a

training resource for mental health-related issues. Members of the School's faculty serve at seven mental health sites around the state. For more information, see www.umaryland.edu/pps/residents/psych.htm.

• The **Nuclear Magnetic Research Center (NMR)** is housed in the School of Pharmacy and the Health Sciences Facility II. The determination of ligand binding sites, and of the structures of their complexes with target biomolecules, is integral to drug discovery and delivery as it greatly aids the optimization of binding site interactions. The NMR Center is well equipped for the determination and verification of the structures of anti-cancer agents, target biomolecules (i.e., DNA, RNA, and protein), and drug transport compounds, as well as the complexes of these. The center has multi-field-strength capabilities, as it owns two NMR spectrometers, a GE-QE 300MHz and a Varian INOVA 500 MHz, and jointly owns two additional spectrometers, operating at 600 MHz and 800 MHz. These machines, jointly owned by the School of Pharmacy and the School of Medicine are a Bruker AMX 600 MHz and a Bruker Avance 800 MHz spectrometer. Both of these have cryoprobes to improve signal-to-noise and decrease spectrum acquisition time, by reducing the electrical noise of the system. This is most useful for biomolecular structure and dynamics studies. In addition, QSAR-type screening of small libraries of potential anti-cancer agents can be performed, with larger libraries possible once the purchase of an auto-sampler is arranged. For more information, see www.pharmacy.umaryland.edu/psc/nmr/.

UNIVERSITY OF MARYLAND, BALTIMORE

The University of Maryland, Baltimore, is on the west side of downtown Baltimore, a short walk from the Inner Harbor's waterfront museums, restaurants, hotels, and shops, and from Camden Yards and the Super Bowl champion Ravens' M&T Bank Stadium.

The 50-acre campus is a mix of historic buildings and high-tech labs and health facilities, including the University of Maryland Medical Center and the Veterans Affairs Medical Center. The six professional schools and a graduate school are dedicated to excellence in professional and graduate education, research, public service, and patient care.

With approximately \$390 million in sponsored activities for Fiscal Year 2005, the University uses state-of-the-art technological support to educate leaders in health care delivery, biomedical science, social services, and law. The campus fosters economic development in the state by conducting internationally recognized research to cure disease and to improve the health, social functioning, and just treatment of the people served. The University is committed to ensuring that the knowledge it generates provides maximum benefit to society, directly enhancing the community. For more information about the campus see www.umaryland.edu/prospective/index.html#getting.



(left to right) Students Jason Katzoff and Joseph Lewis review a prescription in the Practice Lab.



(left to right) Josephine Leung, Annette Gbemudu, Samuel Lee, Jennifer Huang, Andrew Levine, Doan Nguyen, Gina Yi, and Stacy Calloway at the Academy of Managed Care Pharmacy Convention in Denver, Colo.

DOCTOR OF PHARMACY (PHARM.D) PROGRAM

The Doctor of Pharmacy (PharmD) program at the University of Maryland has been developed in partnership with practitioners from all areas of pharmacy and emphasizes problem solving, critical thinking, patient-focused content, and experiential opportunities across the breadth of practice. Due in part to this innovative curriculum, the School is ranked in the top 10 among the nation's pharmacy schools. For more information about the PharmD program, see www.pharmacy.umaryland.edu/admissions/pharmd.htm.

GOALS OF THE PHARM.D CURRICULUM

The goals and objectives of the PharmD program are:

- To help individuals gain the knowledge and skills necessary to begin pharmacy practice, and in so doing, accept and perform professional responsibilities with competence. Graduates should have the ability to adapt their practice to the changing health care system and should be prepared to engage in a continuing program of professional development.
- To provide the professional curricula that will be innovative and flexible, based on strong basic sciences, have extensive clinical content taught by practice-based faculty members, and emphasize the development of problem solving and collaborative skills. The curricula also will provide the opportunity for advanced professional and clinical education.
- To create an educational community that extends beyond traditional classroom sites and offers students and faculty members a variety of learning environments. These will include cultural and interprofessional programs that broaden the experiences of our graduates.

ADMISSIONS INFORMATION

An admissions committee comprised of faculty members and students reviews official transcripts, letters of recommendation, work experience, extracurricular activities, and PCAT results to make admissions decisions. Applicants are invited to interview with faculty members, alumni, and students. During the interview, the applicant is assessed on factors such as problem solving ability, professional

and social awareness, verbal and written communication skills, integrity, maturity, and motivation. Following the interview, the admissions committee makes a decision based on the applicant's credentials, and qualities evaluated during the interview. Academic achievement and/or high PCAT scores do not, in themselves, ensure acceptance into the PharmD program.

While a minimum GPA of 2.5 (A=4.0) is required for admissions consideration, the average entering GPA of the fall 2005 first-year PharmD students was 3.4. Average PCAT scores of admitted students were above the 80th percentile in each of the five areas of the exam. All applicants must present official transcripts to document completion of the prepharmacy coursework with grades of at least a C or better. For more information about the admissions process, see www.pharmacy.umaryland.edu/admissions/.

The School reserves the right to make changes in requirements for admission, curriculum, standards for advancement and graduation, fees, and rules and regulations.

ADMISSIONS PROCEDURE

Each year a growing number of prospective students applies to the School of Pharmacy. The School admits 120 new students each year to the incoming class. To apply to the School, please follow the procedure below. Also, check the admissions Web site for deadlines. Wondering if you are a legacy? See the Alumni Legacy Policy on the applications page to access the criteria established by the Admissions Committee.

Below is the admissions procedure:

- Complete 63 credit hours of pre-pharmacy coursework. **(Chemistry and biology courses must have been taken within five years of admission.)**
- Have a minimum GPA of 2.5.
- Complete an application via PharmCAS at www.pharmcas.org/ by the September deadline for early decision and the application for all others by January. For deadlines see: www.pharmacy.umaryland.edu/admissions/importantdates.htm.
- Submit transcript(s), PCAT scores, and three letters of reference to PharmCAS.

- Complete the supplemental application at www.pharmacy.umaryland.edu/apps/admissionssupplement/. Include the non-refundable \$20 application fee. (See below for details.) After you have completed and submitted your supplemental application by the deadline, send the \$20 check or money order made payable to **University of Maryland** to:

Office of Student Affairs
University of Maryland
School of Pharmacy
20 N. Pine St., Room 224
Baltimore, MD 21201

- Complete the *Maryland Residency Form* at www.pharmacy.umaryland.edu/admissions/pdf/residency_form2004.pdf if you are eligible for in-state status. Mail the form to the Office of Student Affairs at the address above.
- Accept an offer to interview and attend an interview at the School, scheduled by the Admissions Committee.

INTERNATIONAL APPLICANTS' ADMISSIONS PROCEDURE

International applicants, who are not residents of the United States, are required to attend an accredited college or university in the United States for at least one semester. The School recommends that international applicants become familiar with the rules and regulations of the Immigration and Naturalization Service. Additionally, the School recommends that international applicants start the admissions process at least one year before the application deadline. For deadlines see: www.pharmacy.umaryland.edu/admissions/importantdates.htm.

Applicants must:

- Complete 63 credit hours of pre-pharmacy coursework. (Chemistry and biology courses must have been taken within five years of admission.)
- Have a minimum GPA of 2.5.
- Submit the results of the TOEFL (Test of English as a Foreign Language). See the campus minimum acceptable score at www.umaryland.edu/orr/international/admissions.html.

Submit the following to PharmCAS:

- Official copies of transcripts from all post-secondary institutions attended. (Foreign transcripts must be evaluated by a transcript evaluation service.)
- The results of the Pharmacy College Admissions Test (PCAT).
- An application.

Submit the following to the School of Pharmacy:

- The supplemental application at www.pharmacy.umaryland.edu/apps/admissionssupplement/. Include the non-refundable \$20 application fee. (See below for details.) After you have completed and submitted your supplemental application by the deadline, send the \$20 check or money order made payable to **University of Maryland** to:

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University of Maryland
School of Pharmacy
20 N. Pine St., Room 224
Baltimore, MD 21201

- A statement of financial security (See Estimated Educational and Living Expenses at www.umaryland.edu/orr/international/regulations/cost.html in the Office of the Registrar.)

Accept an offer to interview, and attend an interview at the School, scheduled by the Admissions Committee.

INTERNATIONAL PHARMACIST APPLICANTS' ADMISSIONS PROCEDURE

International pharmacists, who currently reside in the United States but who received their license from a recognized school of pharmacy outside of the 50 U.S. states, the District of Columbia, and Puerto Rico, may obtain a license to practice pharmacy in the United States by (1) taking the The Foreign Pharmacy Graduate Examination Committee® (FPGEC®) or (2) by successfully completing a Doctor of Pharmacy program at a school or college of pharmacy in the United States. To get an application form for the FPGEC® and for more information on licensure, visit the National Association of Boards of Pharmacy Web site at www.nabp.net.

Before applying, see the admissions Web site at www.pharmacy.umaryland.edu/admissions/internationalpharmacist.htm to review the International Pharmacists Admissions Policy. International pharmacists who are admitted may be placed in either the first or second year of the PharmD program.

The School recommends that applicants become familiar with the rules and regulations of the Immigration and Naturalization Service. Additionally, the School recommends that applicants start the admissions process at least one year before the application deadline (see deadlines at www.pharmacy.umaryland.edu/admissions/importantdates.htm) and be prepared to pay all expenses.

To apply to the School of Pharmacy, see the application procedure below. Submit the following to the School of Pharmacy:

- A completed application by the deadline, mailed to the Office of Student Affairs. Download the application from www.pharmacy.umaryland.edu/admissions/internationalpharmacist.htm. **(Do not apply to PharmCAS.)**
- A copy of the pharmacy license to the address below.
- An official copy of all transcripts from the pharmacy school and college-level education. (Foreign transcripts must be evaluated by a transcript evaluation service.)
- The results of the PCAT. (See International Pharmacists Admissions Policy.)
- The results of the TOEFL (Test of English as a Foreign Language).
- The supplemental application at www.pharmacy.umaryland.edu/apps/admissionssupplement/. Include the non-refundable \$20 application fee. (See below for details.) After you have completed and submitted your supplemental application by the deadline, send the \$20 check or money order made payable to **University of Maryland** to:

Office of Student Affairs
University of Maryland
School of Pharmacy
20 N. Pine St., Room 224
Baltimore, MD 21201

Accept an offer to interview, and attend an interview, at the School, scheduled by the Admissions Committee.

Sit for an examination to determine placement in the first or second year of the PharmD curriculum. The examination will only be offered to those who have been accepted into the PharmD program. The School determines the date, time, and location of the exam and will notify students.

TRANSFER ADMISSIONS PROCEDURES

The School may accept transfer students, who are currently enrolled in a professional pharmacy program at an accredited school or college of pharmacy, and have a valid reason for requesting a transfer. The Admissions Committee will determine the year transfer students will be placed in the PharmD program. Transfer students are only admitted to the fall semester. Transfer applicants must be in good academic standing at the institutions they are currently attending, with a minimum GPA of 3.0 in current pharmacy coursework.

For deadlines, see www.pharmacy.umaryland.edu/admissions/importantdates.htm.

To apply to the School of Pharmacy, follow the application procedure below. Submit the following to the School of Pharmacy:

- A list of courses in which you are currently enrolled.
- A letter stating the reason for transferring.
- One letter of recommendation from a pharmacy faculty member.
- A completed application by the deadline, mailed to the Office of Student Affairs. Download the application from www.pharmacy.umaryland.edu/admissions/transfer.htm. **(Do not apply to PharmCAS.)**
- An official copy of all transcripts from the pharmacy school in which you are currently enrolled and all post-secondary institutions attended.
- Results of the PCAT (if previously taken).
- The supplemental application at www.pharmacy.umaryland.edu/apps/admissionssupplement/. Include the non-refundable \$20 application fee. (See below for details.) After you have completed and submitted your supplemental application by the deadline, send the \$20 check or money order made payable to **University of Maryland** to:

Office of Student Affairs
University of Maryland
School of Pharmacy
20 N. Pine St., Room 224
Baltimore, MD 21201

- The *Maryland Residency Form* if you are eligible for in-state status. Mail the form to the Office of Student Affairs at the address above. More information about the form is available at www.umaryland.edu/orr/status.html.

Accept an offer to interview, and attend an interview at the School, scheduled by the Admissions Committee.

PRE-PHARMACY COURSEWORK

Applicants must complete a minimum of 63 semester hours of pharmacy prerequisites for admission into the PharmD program. At least one semester of this coursework must be taken at an accredited institution in the United States. To enroll in pre-pharmacy coursework, applicants must apply directly to an accredited college or university, not to the School of Pharmacy. Prerequisites for admission into the PharmD program are as follows:

Note: Chemistry and biology undergraduate courses must be taken within five years and all other courses within 10 years of anticipated admission.

PREREQUISITE COURSES FOR UMB SCHOOL OF PHARMACY

Course	Semester	# Credit Hours
English Composition	1	3
English Literature	1	3
Calculus (with lab)	1	4
Statistics	1	3
Biology (with lab)	1	4
Microbiology (with lab)	1	4
General Chemistry (with lab)	2	8
Organic Chemistry (with lab)	2	8
Physics	2	8
Humanities and Social Sciences.....	4-6.....	18
Total	63 minimum	

PHARMD PROGRAM DESCRIPTION

The four-year Doctor of Pharmacy program is divided into five areas of academic focus: Fundamentals, Basic Sciences, Pharmaceutical Sciences, Integrated Sciences and Therapeutics, and Experiential Learning, which are described below:

FUNDAMENTALS

Students entering the PharmD program have diverse educational and life experiences. The Fundamentals area addresses these diversities with introductory courses covering the concept and scope of pharmaceutical care, pharmacy practice in general, and the variety of disciplines that will contribute to pharmaceutical education. Students are provided the skills and scientific principles and concepts fundamental to subsequent curricular experiences. Students develop professional attitudes and behaviors that extend throughout the curriculum.

BASIC SCIENCES

In the Basic Sciences area of the curriculum, students build on the Fundamentals area through a comprehensive examination of basic biological, chemical, physical, social, and behavioral sciences. These elements provide the foundation for understanding pharmaceutical sciences and the complexities of drug action and use.

PHARMACEUTICAL SCIENCES

The Pharmaceutical Sciences area addresses pharmaceutical science content areas as they relate to the needs of patients in the total health care environment. The provider of pharmaceutical care must possess a detailed and comprehensive understanding of the physical, chemical, biological, and psychosocial factors affecting the outcomes of drug therapy in specific patients with specific diseases.

INTEGRATED SCIENCES AND THERAPEUTICS

Integrated Sciences and Therapeutics addresses the extensive interweaving of basic pharmaceutical and clinical science as well as the interrelated bodies of knowledge involved in total pharmaceutical care. Students build on their basic and pharmaceutical science background as they actively participate in a variety of didactic and laboratory experiences to design, implement, manage, and monitor individualized pharmaceutical care plans. Students learn to

appreciate that the successful outcomes of drug therapies depend on complex physical, chemical, biological, and psychosocial interactions within human systems, and therefore require individualized attention to patients during the design and delivery of pharmaceutical care. The application of these principles is taught by presenting diseases of different body systems within the broader context of public health, epidemiology, prescriber education, disease prevention, and health promotion issues.

Three progressive components are used to present each disease. The first component reviews the drugs and biologicals used to treat specific disease processes and emphasizes comparative features underlying the choice of agent (Pharmacodynamics and Pharmacokinetics). Chemical properties, such as solubility and stability, which determine the choice and use of the products, are discussed (Medicinal Chemistry and Pharmaceutics). The availability and comparative advantages of drug dosage formulations and delivery systems are considered as they relate to the optimum use of drug products during acute or chronic care (Biopharmaceutics).

The second component illustrates how the links between the scientific knowledge of the disease, available drug products, and the variables underlying a particular patient's condition are important to developing the most appropriate therapeutic plan. Methods for the choice of drug products, definition of specific goals of therapy, including how to assess whether these goals are being achieved, and active intervention steps to ensure successful outcomes of drug therapy, are developed (Therapeutics). Methods for monitoring, identifying, and responding to untoward consequences of drug therapy are identified (Toxicology and Adverse Drug Reactions). The choice and design of specific acute and chronic drug therapy, the impact of a variety of patient-related variables on dosage regimens, and the modification of dosage regimens in response to changing patient needs are developed (Clinical Pharmacokinetics). Students develop skills as they practice counseling patients about their therapeutic plans in particular and providing health education in general (Counseling and Education).

The third component links the knowledge base of the first two components with appropriate ongoing methods for drug use review, medical audits, and cost considerations. The emphasis is on identifying specific interventions to improve prescribing patterns and reduce the cost of health care (Drug Use Evaluation).

EXPERIENTIAL LEARNING

Experiential Learning is a series of structured learning and training activities during which students work under the supervision of experienced clinical and academic faculty in a variety of health care settings. Students obtain and apply knowledge and skills necessary for successful delivery of pharmaceutical care and develop competence, confidence, and maturity as responsible professionals. An innovative feature of the program is that experiential learning activities occur throughout the curriculum and are linked to didactic courses. A student's performance during experiential learning is evaluated by both clinical and academic faculty. A total of 33 credits in experiential courses (approximately 1,600 hours) are required for the Doctor of Pharmacy degree. All students must complete at least 24 credits of experience devoted to patient care. Successful completion of the experiential learning portion of the School's curriculum is accepted by the Maryland Board of Pharmacy as meeting the internship requirements to sit for the NABPLEX licensure examination. Experiential rotations are not permitted at sites where students are working for pay or where any other conflict of interest situation may exist. (See the Experiential Learning Policy Manual at www.pharmacy.umaryland.edu/elp/.)

The Experiential Learning portion of the PharmD curriculum is organized as described below:

Introduction to Professional Practice I and II (PHPC 510 and PHPC 520)

This early experience introduces students to the professional responsibilities of pharmacists in a variety of practice environments, including community, hospital, and specialty settings. Students will examine the spectrum of career opportunities available to today's pharmacist and begin developing basic practice skills. During the fall (PHPC 510) and spring (PHPC 520) semesters of the first year, students complete rotations as follows:

- One one-week in a community setting (40 hours)
- One one-week in a hospital setting (40 hours)
- One one-day in a differentiated (non-dispensing) setting (eight hours)

Longitudinal Care I and II (PHPC 532 and PHPC 562)

During the second and third years of the curriculum, students observe and participate in the delivery of pharmaceutical care to patients. For each course, students follow the changing needs of a patient for one year within the context of the total health care system. Through direct patient encounters and discussion sessions, students learn to assess health status, communicate effectively, and determine pharmaceutical care needs from a holistic perspective. These activities are linked to material covered in the didactic curriculum.

Safe Medication Order Processing (PHPC 570 and PHPC 571)

Activities during these rotations develop students' competency and proficiency in the technical functions of drug dispensing and distribution in institutional and community pharmacy settings. Students learn to receive, interpret, and verify the appropriateness of prescription orders and to efficiently dispense a variety of manufactured and compounded medications. Emphasis is placed on communication, prevention of medication errors, the role of technology, and supervision of ancillary personnel in the medication order process. Students are required to complete rotations as follows:

- One four-week in a community setting (150 hours)
- One four-week in a hospital setting (150 hours)

Rotations can be completed the summer after your second year, the winter of the third year, or the summer after the third year.

Pharmaceutical Care (PHPC 572, PHPC 573, and PHPC 574)

Students gain experience in the delivery of pharmaceutical care in a variety of practice environments, including community-based and acute-care hospital pharmacies. Through daily encounters with patients and other health care providers, students learn to collect patient-specific data, identify and assess drug-related problems, develop monitoring plans, and measure therapy outcomes. Further, students learn to educate patients and health care professionals regarding the appropriate use of drugs. Students complete these rotations after successful completion of the third year and PHPC 570 and PHPC 571 as follows:

- One four-week in a community setting (PHPC 572 Community Pharmaceutical Care)
- One four-week in an institutional setting (PHPC 573 Institutional Pharmaceutical Care)
- Two four-weeks of your choice (PHPC 572, PHPC 573, or PHPC 574 General Site Pharmaceutical Care)

Ambulatory Clinic (PHPC 576)

This experience is completed in the fourth year. Students are exposed to the delivery of pharmaceutical care in an ambulatory clinic setting. They will gain skills through one-on-one interactions with patients, care givers, and other health care providers.

Informational Services (PHPC 577)

This course occurs simultaneously with Pharmaceutical Care and requires students to provide drug information in the context of delivering pharmaceutical care. Students learn to receive a question in a comprehensive fashion, thoroughly analyze and research questions, and provide appropriate answers to other health care providers, patients and their families.

Elective Experiences

Elective rotations allow students to pursue their own areas of interest. Electives in general practice environments enable students to develop greater skill, proficiency, and confidence. Electives in specialty pharmacotherapeutic practice areas, alternative forms of advanced practice management, and research afford students opportunities to explore a variety of practice options.

CURRICULUM PATHWAYS AND ADVISING

More than 21 percent of the Doctor of Pharmacy curriculum is reserved for didactic (20 credits) and experiential (8 credits) electives to provide students the flexibility to tailor individual plans to meet their career goals. Students use the *Plan of Study Form* to help design their plans. The "curricular pathways," which organize electives in a logical sequence to better prepare students in particular areas of practice, are detailed below:

PATHWAY SELECTION PROCESS

Students are not required to select a pathway. However, it is recommended that students take advantage of this planning tool and select a pathway.

Students should meet with their academic advisors and other faculty to discuss career planning and elective course selection. Prior to Web-registration, all students must complete a Plan of Study indicating their planned elective course selections and their chosen pathway. This Plan of Study must be reviewed and signed by their academic advisor.

Most pathways will have "core" didactic elective courses that present key content material. If students select a given pathway, it is expected that they will take these core elective courses. Some pathways will also have experiential rotations associated with them. Some rotations may be designated as "core" rotations for particular pathways. For more information, see www.pharmacy.umaryland.edu/studentaffairs/registration/registration.htm.

Students participating in the dual degree programs (PharmD/MBA, PharmD/JD, or PharmD/MPH) must indicate this fact on their Plan of Study.

Students may change pathways in order to maintain desired flexibility. Students can change at the beginning of each semester after consulting with their academic advisors.

Students may take courses from all pathways (to maintain desired flexibility) as long as prerequisites are met for individual courses.

To date, five pathways have been developed: Geriatric Pharmacy Practice, Management, Pharmacotherapy, Advanced Pharmacy Practice, and Research. Pathways are administrated by pathway coordinators who have expertise in the pathway area and are available for career consultation to supplement student interaction with academic advisors. Students should take full advantage of these counseling opportunities when deciding on the choice of pathway. Pathway coordinators include:

Advanced Pharmacy Practice

Dr. Cynthia Boyle 410-706-1495

Geriatric Pharmacy Practice

Dr. Nicole Brandt 410-706-1491

Management

Dr. Magaly Rodriguez de Bittner 410-706-4146

Pharmacotherapy

Dr. David Roffman 410-706-3215

Research

Dr. Richard Dalby 410-706-3245

ADVANCED PHARMACY PRACTICE

The goal of this pathway is to prepare students to implement pharmaceutical care in a variety of practice settings. This pathway provides a series of didactic and experiential courses designed to enhance competence in delivering pharmaceutical care in general practice and in delivering health care to special populations such as the elderly; to enhance knowledge of special pharmaceutical products, business and managerial skills needed to successfully deliver new services; and to provide experience in applying these professional and managerial skills in a variety of advanced practice settings.

GERIATRIC PHARMACY PRACTICE

This pathway is designed to prepare graduates to work with older individuals in a variety of practice settings or pursue advanced degrees (PhD, MPH) or training (fellowships, residencies) in the area of geriatrics or gerontology. By completing this pathway, graduates will learn essential principles to manage medication-related issues as well as understand the complexities in caring for the elderly. Outcomes are to develop a database of current students and graduates focusing in the area of geriatrics. Students selecting this pathway must complete 12 credits: the core 5 credits of didactic electives, 4 credits of other geriatric-focused electives or special projects, and 3 credits of geriatric-focused geriatric rotations.

MANAGEMENT

This pathway is designed to prepare students for management careers in corporate pharmacy, to develop entrepreneurial capabilities, and to prepare students for post-PharmD management residencies and/or MBA programs. Students take a series of didactic and experiential courses in practice management, organizational behavior, financial reporting and analysis, marketing, and working with managers in a variety of health care settings.

PHARMACOTHERAPY

The goal of this pathway is to enhance students' ability to independently optimize, implement, and monitor drug therapy in patients with complex health problems. This pathway offers a series of didactic seminar courses in pharmacotherapy and advanced therapeutics, coupled with advanced clinical experiences. The clinical experiences involve direct drug therapy management of patients in general medical and sub-specialty environments. Students completing this pathway are encouraged to pursue post-PharmD training in residencies and fellowships and to eventually pursue specialty board certification in pharmacotherapy.

RESEARCH

The goal of this pathway is to expose students to research and better prepare them for graduate studies or postgraduate fellowships. Students selecting this pathway take courses in advanced educational opportunities and advanced seminar courses in selected scientific areas. They receive research experiences, working directly with faculty scientists, and take a senior colloquium. Students are also encouraged to pursue a PhD.

PHARMD PROGRAM SUMMARY

The faculty continue to revise the curriculum based on the dynamics of pharmacy education, the needs of practice, and the students. The exact nature of the curriculum may vary from class to class. The following describes the PharmD curriculum by semester.

COURSEWORK	MINIMUM SEMESTER CREDITS
Didactic	99 credits
79 Required	
20 Elective	
Experiential	33 credits
25 Required	
8 Elective	
TOTAL	132 credits

COURSEWORK BY SEMESTER

The required components of the curriculum by semester are outlined below. Electives can be taken during most fall, winter, spring, and summer semesters.

The total and minimum semester credits for didactic and experiential courses are listed in parentheses.

FALL FIRST-YEAR COURSES

PHAR 510 Biochemistry	3 cr.
PHAR 513 Drug Chemistry	2 cr.
PHAR 514 Human Biology I	3 cr.
PHAR 516 Pharmacy Prac & Educ	2 cr.
PHAR 522 Context of Health Care	3 cr.
PHAR 523 Ethics in Pharmacy Practice	1 cr.
PHAR 526 Physical Chemistry	2 cr.
PHPC 510 Intro to Prof Practice I	1 cr.
Total required	17 (16/1)

SPRING FIRST-YEAR COURSES

PHAR 517 Study Design & Analysis	2 cr.
PHAR 520 Molecular Biology	3 cr.
PHAR 524 Human Biology II	3 cr.
PHAR 531 Pharmaceutical Chem	2 cr.
PHAR 537 Principles Drug Action	2 cr.
PHPC 520 Intro to Prof Practice II	1 cr.
Total required	13 (12/1)

FALL SECOND-YEAR COURSES

PHAR 525 Immunology	2 cr.
PHAR 530 Microbiology/Antibiotics I	2 cr.
PHAR 532 Patient-Centered Pharm Mgmt I	2 cr.
PHAR 533 Medicinal Chemistry I	1 cr.
PHAR 534 Human Biology III	3 cr.
PHAR 536 Pharmacology I	3 cr.
PHAR 541 Biopharmaceutics/Kinetics	3 cr.
Total required	16 (16/0)
Students register for Jun–Nov Phase VI rotations	

SPRING SECOND-YEAR COURSES

PHAR 535 Pharmaceutics	3 cr.
PHAR 540 Microbiology/Antibiotics II	2 cr.
PHAR 542 Clinical Chemistry	1 cr.
PHAR 543 Medicinal Chemistry II	2 cr.
PHAR 544 Patient Centered Pharm Mgmt II	2 cr.
PHAR 546 Pharmacology II	3 cr.
PHPC 532 Longitudinal Care I	1 cr.
Total required	14 (13/1)
Students register for Dec–May Phase VI rotations	

FALL THIRD-YEAR COURSES

PHAR 552 Principles of Human Nutrition	1 cr.
PHAR 553 Population Based Medical Info	2 cr.
PHAR 554 ISAT I	4 cr.
PHAR 555 ISAT II	4 cr.
Total required	11 (11/0)

Students will also register for Jun–Nov
Phase III and Phase VI rotations

SPRING THIRD-YEAR COURSES

PHAR 564 ISAT III	4 cr.
PHAR 565 ISAT IV	4 cr.
PHPC 562 Longitudinal Care II	1 cr.
Total required	9 (8/1)

Students will also register for Dec–May
Phase III and Phase VI rotations

FALL FOURTH-YEAR COURSES

Students will register for Jun–Nov
Phase III, IV, and VI rotations

SPRING FOURTH-YEAR COURSES

Students will register for Dec–May Phase III, IV, IVa, V, and VI rotations	
PHAR 580 Pharmacy Law	2 cr.
PHAR 581 Senior Colloquium	1 cr.
Total required	3 (3/0)

PHASE DESCRIPTIONS

PHASE III ROTATIONS	6 cr.
PHPC 570 Safe Med Process Community	3 cr.
PHPC 571 Safe Med Process Institution	3 cr.

PHASE IV / IVa ROTATIONS 13 cr. required

PHPC 572 Community Pharm Care	3 cr.
PHPC 573 Institution Pharm Care	3 cr.
PHPC 574 General Pharm Care	3 cr.
PHPC 576 Ambulatory Clinic	1 cr.

PHASE V ROTATION 2 cr.

PHPC 577 Information Services	2 cr.
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PHASE VI

ELECTIVE ROTATIONS	8 cr. minimum
Various PHEX courses	

PHARM.D DUAL DEGREE PROGRAMS

The School offers three dual degree programs for PharmD students who are interested in gaining specialized expertise in law, business administration, or public health. Students apply to these programs in the second year of the PharmD program. The dual degree programs have separate admission requirements. The programs are briefly described below.

PHARM.D/JD PROGRAM

The School offers a dual Doctor of Pharmacy/Juris Doctor degree program with the University of Maryland School of Law for students who wish to pursue the Juris Doctor. Graduates of the PharmD/JD program will be prepared for careers in a diverse range of health care and legal areas, such as consulting on health law issues and regulatory policy for government agencies, trade associations and pharmaceutical companies. PharmD students can use 16 credit hours obtained from the law curriculum to fulfill their 20 hours of didactic pharmacy electives. Students could complete the dual degree program in six years. PharmD students must apply to the JD program and meet all admissions criteria, including submitting results of the LSAT, and adhere to the School of Law's procedures and deadlines. Admission is not guaranteed. For more information about the JD program, contact the School of Law at 410-706-3492 or e-mail admissions@law.umaryland.edu.

PHARM.D/MBA PROGRAM

The School offers a dual Doctor of Pharmacy/Master of Business Administration program with the University of Baltimore Merrick School of Business for students who wish to pursue the Master of Business Administration degree. The PharmD/MBA program allows pharmacy students to take MBA courses as part of their PharmD curriculum. While in pharmacy school, PharmD students may complete 20 of the 48 credit hours required in the MBA program. PharmD students must apply to the MBA program; admission is not guaranteed. Students wishing to apply to the MBA program must adhere to University of Baltimore (UB) procedures and deadlines. Students must also request that the University of Maryland's Office of Records and Registration send their official University of Maryland transcript and that the

School of Pharmacy Office of Student Affairs send a copy of their prepharmacy transcripts to UB. Students applying to this dual program need the equivalent of a bachelor's degree (i.e., either a degree or completion of four years of college). The grade point average for an entering MBA student is 3.0; however, a lower GPA may be offset by a higher score on a standardized test (e.g., GMAT, PCAT). For more information about the MBA program, contact the Advising Center at the University of Baltimore at 410-837-4944. For information about the admissions process, contact the Office of Graduate Admissions at 410-APPLYUB or see <http://business.ubalt.edu/graduateprograms/pharmd.html>.

PHARMD/MPH PROGRAM

There is an increasing need for well-trained pharmacists who also have a comprehensive understanding and appreciation of public health issues. The purpose of the PharmD/MPH dual program is to facilitate the process of Doctor of Pharmacy (PharmD) students obtaining a Master of Public Health (MPH) degree. The MPH program is based in the School of Public Health. To obtain the MPH degree, students must earn 36 credits including a 6-hour supervised project (the "capstone" experience). The department will allow pharmacy students to use 6 credits obtained in the School of Pharmacy coursework toward fulfilling the 36-hour requirement within the MPH program. The School of Pharmacy will allow students to count credits earned in MPH courses toward their 20 didactic elective credits. For more information about the MPH program, contact the Department of Epidemiology and Preventive Medicine (DEPM) in the University of Maryland School of Medicine at <http://medschool.umaryland.edu/epidemiology/>.

LICENSURE REQUIREMENTS

Students who complete the PharmD degree satisfy the educational requirement for all state boards of pharmacy in the United States. Graduates are eligible to take state licensing exams in all states. For more information about licensure as a pharmacist in Maryland, graduates may contact the Maryland Board of Pharmacy at 4201 Patterson Ave., Baltimore, MD 21215-2299, call 410-764-4755, or e-mail mdbop@dhmh.state.md.us. For more information about international pharmacist licensure, international pharmacists can contact the National Association of Boards of Pharmacy at: www.nabp.net/ or call 847-391-4406/ fax 847-391-4502.

DOCTOR OF PHILOSOPHY (PHD) PROGRAMS

Applicants seeking advanced degrees, MS and PhD, in pharmaceutical health services research or pharmaceutical sciences must apply to the University's Graduate School departments. Interested applicants also should review the Graduate School catalog for more specific information about the MS and PhD programs. The PhD programs in Pharmaceutical Health Services Research and Pharmaceutical Sciences are described as follows. Interested applicants may apply online at <http://graduate.umaryland.edu/admissions/admissions.html> or, if necessary, obtain an application form from the department to which they are applying.

Opportunities are available for postgraduate study: residencies, postdoctoral fellowships, and other professional studies. Contact the department for specific information.

PHARMACEUTICAL HEALTH SERVICES RESEARCH PHD PROGRAM

The graduate program in Pharmaceutical Health Services Research seeks to train scholars and researchers in one of four major research areas: pharmacoeconomics, pharmacoepidemiology, health behavior sciences, or pharmaceutical policy as it relates to the delivery, use, costs, and safety of pharmaceuticals and other health care products. Students are required to select one research area or track of specialization in which they will take advanced courses and conduct their dissertation research. Graduates of the program will receive training to: 1) design and carry out pharmaceutical health services research based on strong training in research methodologies, statistics, one or more pharmacy specialty areas, and a sound understanding of the U.S. health care system; 2) serve as a knowledgeable spokesperson to the public and private sectors of health care concerning pharmaceutical health services research, practice research, and pharmacy-related policy issues; 3) interact with members of other health, social, and administrative disciplines and initiate and/or collaborate in research endeavors related to pharmaceuticals and other health services; and 4) be an effective teacher both in academic and nonacademic settings.

For more information, see www.pharmacy.umaryland.edu/graduate/pshr.

PROGRAM OVERVIEW

The PhD graduate program in Pharmaceutical Health Services Research offers advanced training by faculty who are regional, national, and international leaders in the fields of pharmacoeconomics, pharmacoepidemiology, pharmaceutical policy, and the health behavior sciences. The specialized curriculum, with an emphasis on developing research skills, trains students for leadership roles in academia, government, industry, and consulting.

ADMISSIONS INFORMATION

Applicants to the Doctor of Philosophy in Pharmaceutical Health Services Research should possess a bachelor's or master's degree from an accredited college or university. Applicants with previous pharmacy-related education and/or experience will be given preference. Applicants must satisfy the general requirements of the University's Graduate School before consideration for admission to the program. The minimum standard for admission to the Graduate School is a B average, or 3.0 on a 4.0 scale, in a program of study resulting in the award of a baccalaureate degree from an accredited college or university.

APPLICATION PROCEDURE

Applications to the graduate program in Pharmaceutical Health Services Research should be directed to the following address: Graduate School, University of Maryland, 515 W. Lombard St., Suite 208, Baltimore, MD 21201; 410-706-7131. An online application is available at <http://graduate.umaryland.edu/admissions/instructions.html>. The following forms and/or documents are required for processing of an application by the Graduate School:

- Application for Admission
- Statement of Goals and Objectives*
- Official Transcripts (two copies)
- Letters of Recommendation (three letters of reference)*
- Results of the Graduate Record Exam (two official copies)
- Application Fee
- TOEFL Scores (international applicants)

- Statement of Financial Status (international applicants)
- Immigration Documents (I-20 form; international student applicants)

* These items should be mailed directly to the PHSR program.

The PHSR program primarily grants admission for the fall semester. Applicants interested in applying for admission should submit their application materials by January 1 of the year they intend to enroll for the fall semester although the official Graduate School deadlines for application submission are January 15 (international applicants) and July 1 (U.S. citizens and permanent residents). Applicants interested in receiving an assistantship should apply by January 1. Applicants for spring admission should contact the program directly. For more information, interested applicants may contact the department at:

Pharmaceutical Health Services
Research Graduate Program
University of Maryland School of Pharmacy
515 W. Lombard St., Second Floor
Baltimore, MD 21201

- Applications to the PHSR program are reviewed by an Admissions Committee. After the initial review of the applications, selected applicants may be invited for a personal interview and tour of the campus and facilities.
- Applicants who fail to meet the minimum standards may be admitted to graduate study as provisional students on the basis of outstanding performance on the Graduate Record Examination and on the basis of letters of recommendation from competent judges of their performance as students or of their professional capacity. Provisional admissions carry explicit conditions (e.g., minimal grade requirements in stipulated courses) that must be met before the student can be advanced to full graduate status. Specific conditions for admission as a provisional graduate student may be found in the current edition of the *Graduate School Catalog*.

ACADEMIC PROGRAM REQUIREMENTS

The minimum requirements for a student to receive a doctoral degree in the Pharmaceutical Health Services Research graduate program are detailed below. Individual students might be required to take additional courses as deemed appropriate by their curriculum committee. In particular, students without strong computer programming skills may need elective courses.

Required courses include a group of core graduate courses in pharmacoepidemiology, pharmacoconomics, pharmaceutical policy, and health behavior sciences, in addition to research methods, and statistics. Students must complete at least 12 credits of advanced courses in their research track beyond any core courses. It generally takes two to two-and-a-half years to complete the course requirements. Although many students come to the program with prior graduate work, the department requires that they take the core courses here. When non-core courses or the beginning/intermediate statistics requirements are waived, students are expected to take other advanced courses to complete the course requirements. To allow flexibility and to ensure that students are well prepared in their area of specialization, each student is asked to establish a curriculum committee by the end of their first year of study.

The following outlines the required core course curriculum for the program:

Core Course Curriculum (35 credits)

COURSES	CREDITS
PHSR 610 Health Care System	3
PHSR 620 Intro to Health Behavior Theory	3
PHSR 650 Pharmaceutical Economics	3
PHSR 704 Pharmacoepidemiology	3
PHSR 701 Research Methods I	3
PHSR 702 Research Methods II	3
PREV 600 Principles of Epidemiology	3
PREV 619 Biostatistical Computing	2
PREV 620 Principles of Biostatistics	3
Statistics	6
PHSR 709 Seminar*	3

Advanced Cognate

Coursework	12
PHSR 899 Dissertation	12

*Graduate seminar is conducted weekly to inform students and faculty about new research and current issues. Seminar attendance is mandatory for all graduate students. Additionally, students must register and present at least three separate seminar topics. Students receive 1 credit for successfully preparing and delivering a seminar on an ongoing research project or research proposal under the direction of a faculty member. Each student must have at least 1 seminar credit prior to taking his or her general comprehensive examination. Furthermore, students must present their dissertation research or proposal in seminar before they can defend their dissertation.

COMPREHENSIVE AND COGNATE EXAMINATION

The purpose of the comprehensive examination is to test students' depth and breadth of knowledge in the field of pharmaceutical health services research. The comprehensive exam examines the students' knowledge in the five core areas of pharmaceutical health services research: pharmacoconomics, pharmacoepidemiology, health behavior sciences, pharmaceutical policy and methodological theory. Students are also required to take a cognate examination, which examines their knowledge within their chosen area of specialization. Students are expected to be fluent in research techniques, current developments, general research methods, study designs, statistical methods, and their professional and ethical responsibilities. Students should not only know the basic concepts, but also be able to interpret and apply them under various scenarios.

DISSERTATION

The dissertation is the product of intensive research at the doctoral level, distinguished by its deeper, more comprehensive, professional and scholarly treatment of the subject. The doctoral dissertation is expected to represent independent and original research in the field of the candidate's graduate study. It must add to understanding in the candidate's field. The project must be of sufficient difficulty and depth to test the candidate's ability to carry out research independently, and it should show a mastery of the skills needed for such research.

ORAL DEFENSE OF DISSERTATION PROPOSAL

Students must submit the proposal to the dissertation committee for review and comment. The student, in consultation with the research advisor, will schedule the oral examination to defend the research proposal.

FINAL ORAL EXAM DEFENSE

After completing the dissertation, the candidate must defend it before the academic community. The defense is open to all members of the University graduate faculty. Regulations governing the style, format, and how to submit the dissertation for publication may be obtained from the Graduate School.

ADDITIONAL ACTIVITIES

Teaching experience is required during the first year. Doctoral students in PHSR are expected to participate as fully as possible in opportunities to develop their teaching skills.

Participating in professional meetings and organizations is recommended. Students are encouraged to submit papers to local, regional, and national professional meetings.

FINANCIAL SUPPORT

Financial support is available to students admitted into the program: graduate assistantships funded by the Graduate School, graduate research assistantships funded by faculty-sponsored projects, and graduate teaching assistantships funded by the School of Pharmacy.

PHARMACEUTICAL SCIENCES PHD PROGRAM

Graduate students, staff, and faculty are pursuing a wide range of pharmaceutical research, such as biotechnology-related pharmaceutical science research involving molecular biology; macromolecular structure, dynamics and drug design; pharmacology and neuroscience; and novel drug and gene delivery. Pharmaceutical sciences is the largest graduate program on campus and perhaps the largest of its type in the United States. This critical mass of graduate students working with more than 30 faculty and staff members provides a stimulating environment for the pharmaceutical sciences graduate student.

For more information, see www.pharmacy.umaryland.edu/graduate/psc/default.htm.

PHARMACEUTICAL SCIENCES DEPARTMENT OVERVIEW

The Department of Pharmaceutical Sciences graduate program prepares independent, creative scientists to excel in various scientific fields. Graduates will be educated with the knowledge and skills to direct the discovery of novel biological pathways in human disease and the development and delivery of medications for safe and effective therapy.

The department has a rapidly expanding research program in the areas of cellular and molecular biology, chemistry, neuroscience and pharmacology, biopharmaceutics and drug delivery, and clinical pharmaceutical sciences. Faculty and graduate students in the department are organized into Research Pathways. The mission of each Research Pathway is to foster individual and collaborative research, faculty growth, and a graduate student education that provides a strong, broad background in the drug development process along with intensive expertise in a focal research area of the pharmaceutical sciences.

The newest pathway is Clinical Pharmaceutical Sciences. This is one of only four such programmatic themes of its kind in the United States. It is a collaborative effort between the School of Pharmacy's Department of Pharmaceutical Sciences and the Department of Pharmacy Practice and Science, and draws upon each department's existing academic and research strengths. The clinical pharmaceutical

research scientists trained by this program will be well-suited to meet the demand expressed by federal agencies (FDA, NIH), academia, and the pharmaceutical industry, with the potential to develop new therapeutic strategies to optimize patient care in Maryland, the United States and the world.

ADMISSIONS INFORMATION

Admission to the graduate program is contingent upon satisfying the admission requirements of the Graduate School (see <http://graduate.umaryland.edu/admissions/admissions.html>). In most instances, candidates for admission who have earned a BA or BS degree in chemistry, biology, biochemistry, psychology, chemical engineering or in pharmaceutical science possess adequate preparation for the graduate program.

A completed application form, official test scores (not copies), official transcripts, (mailed to the **Graduate School**) and other supporting documentation are required. Completed applications received before January 16 will be notified of our decision in early February, and will be preferentially processed over later applications. Deadline for the Pharmaceutical Sciences graduate program is **March 1**. Selected applicants may be invited for a personal interview and tour of the campus and facilities. Applications are accepted for fall only.

Applications for admission to the graduate program are evaluated on the basis of the following:

- GPA (minimum 3.0) and overall quality of academic transcripts (official transcripts), mailed to the Graduate School at:
 University of Maryland
 Graduate Enrollment Affairs
 515 W. Lombard St., Suite 208
 Baltimore, MD 21201
- Graduate Record Examination (GRE) scores, minimum 500 verbal, 500 quantitative, and minimum 4 for analytical, (mailed to the Graduate School).
- TOEFL or IELTS scores (for international applicants), minimum 600, (computer version 250-260), (mailed to the Graduate School). Please use code 5848 for the Graduate School, and 0613 for the Department of Pharmaceutical Sciences.

- Three letters of recommendation (see www.pharmacy.umaryland.edu/graduate/psc/admission/recommend.pdf) mailed to the Department of Pharmaceutical Sciences.
- A Statement of Academic Goals and Research Interests that are compatible with faculty research projects, mailed to the Department of Pharmaceutical Sciences at:

University of Maryland School of Pharmacy
Department of Pharmaceutical Sciences
Graduate Program Office
20 N. Pine St., Suite 538
Baltimore MD, 21201

In your Statement of Academic Goals and Research Interests, please discuss concisely your academic objectives pertaining to the pharmaceutical sciences and your professional career goals. Include a description of relevant work experience as appropriate. To facilitate review of your application, please denote a research pathway (see Programs) at the top of your statement. **This program offers only a PhD degree.**

PHARMACEUTICAL SCIENCES PHD PROGRAM DESCRIPTION

The goal of the Department of Pharmaceutical Sciences graduate program is to prepare independent, creative scientists to excel in academia, the pharmaceutical industry, and in government or other research institutions. Our graduates will be educated with the knowledge and skills to direct the discovery, development, and delivery of medications for safe and effective therapy. For more information about the Department of Pharmaceutical Sciences, see www.pharmacy.umaryland.edu/graduate/psc/.

CURRICULAR REQUIREMENTS

The graduate program is "mentor-driven" – a plan of study is individualized and dependent on the student's and mentor's specific research interests. Each student develops his/her educational experience with the advice of a mentor and an Advisory/Thesis Committee. The awarding of the degree is contingent upon the candidate's successful defense of a dissertation based on independent original research.

To graduate, students must complete at a minimum:

Required Core Curriculum

PHAR 600	
Principles of Drug Discovery	3 cr. ¹
PHAR 601	
Principles of Drug Development	3 cr. ¹
PHAR 628	
Bioanalytical and Pharmacological Methods	
6 modules	3 cr. ²
PHAR 639	
Molecular Spectroscopy and Imaging	
6 modules	3 cr. ²
Ethics course	1 cr. minimum

¹ PharmD students may take 1-3 credits.

² Four credits (8 modules) out of 12 modules total from the two courses are required.

Required Student Rotations

PHAR 608	1 cr.
Students are required to complete at least two rotations.	

Required Seminars

1. PHAR 708
- Comprehensive exam seminar
2. PHAR 709
- Departmental seminar
- Students are required to present one departmental seminar after their comprehensive exam. Students register for 1 credit during the semester that they are presenting.
3. Dissertation defense
- Some of the elective courses available for each pathway:

- Three courses or the equivalent to be determined by the mentor and Advisory Committee

- At least three additional graduate-level courses selected by student and faculty mentors, or in collaboration with the relevant pathways

Cellular and Biological Chemistry Pathway	
PHAR 751 Drug Design	3 cr.
MMCB 601 Advances in Cell Biology	3 cr.
MMCB 602 Advances in Molecular Biology	3 cr.

MPHY 616 Molecular Mechanisms of Signal Transduction	3 cr.
MBIC 703 Advanced Molecular Biology	3 cr.
MCCB 701 Macromolecular Structure and Function	3 cr.

Biopharmaceutics and Drug Delivery Technology Pathway

PHAR 602 Biopharmaceutics and Pharmacokinetics	3 cr.
PHAR 610 Pharmaceutical Formulation and Unit Processes	4 cr.
PHAR 620 Modern Methods of Drug Delivery	4 cr.
PHAR 707 Drug Transport and Metabolism	4 cr.
PHAR 747 Advanced Pharmacokinetics	3 cr.
PHAR 702 Theoretical Aspects of Solid Dosage Forms	3 cr.

Pharmacology and Neuroscience Pathway

PHAR 638 Pharmacometrics and Experimental Design	3 cr.
PHAR 653 Advanced Pharmacology I	4 cr.
PHAR 654 Advanced Pharmacology II	4 cr.
PHAR729 Principles of Drug Action	3 cr.

Clinical Pharmaceutical Sciences

See www.pharmacy.umaryland.edu/graduate/cps for classes.

Dissertation Research/Thesis Committee

PHAR 899 Doctoral Dissertation Research	1-3 cr.
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Students need a total of 12 credits.

The thesis committee is formed after the comprehensive exam and is required to meet on a yearly basis to evaluate progress and direction (may need to meet more frequently to suit individual student needs).

FACULTY RESEARCH AREAS

- Larry L. Augsburger, pharmaceutical processing; design and release of oral solid dosage forms; product quality and performance of nutraceuticals (www.pharmacy.umaryland.edu/faculty/laugsbur)
- Adrian H. Batchelor, X-ray crystallography; plasmodium falciparum (www.pharmacy.umaryland.edu/faculty/abatchel)
- Gary G. Buterbaugh, pharmacology of epileptic seizures
- Andrew Coop, organic and medicinal chemistry; opioid and sigma receptors (www.pharmacy.umaryland.edu/faculty/acoop)
- Richard N. Dalby, optimization of respiratory drug delivery; metered dose inhalers (MDIs); dry powdered inhalers (DPI); nebulizers (www.pharmacy.umaryland.edu/faculty/rdalby)
- Natalie D. Eddington, pharmacokinetics of drugs across biological membranes; pharmacodynamic relationships
- Hamid Ghandehari, novel methods of controlled drug delivery; polymers; biomaterials (www.pharmacy.umaryland.edu/faculty/hghandeh)
- Jun Hayashi, molecular mechanism of T cell antigen receptor activation signaling, autocrine B cell growth factor; development of novel small molecule inhibitors of allergies and human breast cancer cells
- Stephen W. Hoag, oral solid dosage forms; Process Analytical Technology (www.pharmacy.umaryland.edu/faculty/shoag)
- R. Gary Hollenbeck, physical pharmacy to the development and evaluation of novel drug delivery systems (www.pharmacy.umaryland.edu/faculty/ghollenb)
- Kwang Chul Kim, cell biology; epithelial cell surface mucins (MUC1 mucins)
- Insong James Lee, MUC1; function of the novel proto-oncogene; LETMD1 (www.pharmacy.umaryland.edu/faculty/kkim)

- Alexander D. MacKerell Jr., computational and theoretical studies of biological, pharmaceutical and chemical systems; structure-function relationships of proteins and nucleic acids; computer-aided drug design targeting cancer, opioids and immunosuppression; development of empirical force fields for biological and pharmaceutical compounds (www.pharmacy.umaryland.edu/faculty/amackere)
- Sarah L. J. Michel, bioinorganic chemistry; roles of metal ions in homeostasis and toxicity (www.pharmacy.umaryland.edu/faculty/smichel)
- J. Edward Moreton, behavioral pharmacology; drugs of abuse; neuropharmacology; neuroprotective drugs (www.pharmacy.umaryland.edu/psc/facultyresearch.htm#moreton)
- James E. Polli, oral drug absorption; bioavailability considerations in drug design and the pharmacokinetic evaluation of oral solid dosage forms (www.pharmacy.umaryland.edu/faculty/jpolli)
- Gerald M. Rosen, free radicals in biological systems; host immune response (www.pharmacy.umaryland.edu/faculty/grosen)
- Michael J. Shapiro, application and development of NMR methodologies and strategies and their corresponding utility to understand the structure and function of therapeutic proteins in structure-based drug design (www.pharmacy.umaryland.edu/psc/facultyresearch.htm#shapiro)
- Paul S. Shapiro, regulation and function of the extracellular signal-regulated kinase (ERK) proteins during cell cycle control (www.pharmacy.umaryland.edu/faculty/ps Shapiro)
- Peter Swaan, cell biology; computational chemistry; drug bioavailability; drug delivery (www.pharmacy.umaryland.edu/faculty/pswaan/default.htm)
- Ashiwele S. Undie, signaling mechanisms in dopamine receptor synergism; cellular targets of antidepressant medications; pathways to psychostimulant addiction; cell death and drug action in Parkinson's disease (www.pharmacy.umaryland.edu/faculty/aundie)
- Jia Bei Wang, understand brain function, molecular and cellular basis of mental diseases, and the discovery of new medicine and treatment strategies for these diseases; role of opioid receptor phosphorylation in mediating the signal transduction and behavioral effect of morphine and other psychostimulants
- Myron Weiner, mechanisms of alterations in hepatic drug metabolism in rats initiated by aging, exercise and adenosine; isozymes of cytochrome P450; hepatocytes (www.pharmacy.umaryland.edu/faculty/mweiner)
- Angela Wilks, relationship of structure to function in heme proteins; acquisition and utilization of heme by bacterial pathogens such as *Shigella dysenteriae*, *Vibrio cholerae* and *Corynebacterium diphtheriae* (www.pharmacy.umaryland.edu/faculty/awilks)

ACADEMIC RESOURCES

The Department of Pharmaceutical Sciences conducts state-of-the-art research and discovery in the areas of cellular and chemical biology, neuroscience, pharmacology, biopharmaceutics and drug delivery. Over the last fiscal year, we experienced a 39 percent increase in research funding to \$12.4 million in research dollars in Fiscal Year 2004. As such, the faculty in the Department of Pharmaceutical Sciences (PSC) have laid the foundation for the strengthening of research focus areas and organized research centers. The faculty, graduate students, postdoctoral scholars and staff who comprise the Department of Pharmaceutical Sciences are engaged in a broad array of pharmaceutical research activities consistent with the drug design, development and evaluation process. This process begins through our Computer-Aided Drug Design Center with the identification of new and novel therapeutic targets and receptors and continues with the design and synthesis of new chemical entities. The biologic activity or efficacy of therapeutic agents and their endogenous counterparts are evaluated through appropriate cellular or animal models including dopaminergic, opioid, chemotherapeutic, anti-hypertensive as well as other appropriate in vitro and in vivo models. The Industrial Pharmaceutics Laboratory and the Center for Nanomedicine and Cellular Delivery work on the targeted delivery of therapeutic agents to their site of action.

Finally, the Pharmacokinetics-Biopharmaceutics Laboratory evaluates the disposition, pharmacodynamics and clinical efficacy of these agents. Research activities within the department are supported by various core facilities including: Mass Spectrometry, NMR, X-ray crystallography, Confocal Microscopy, and Synthetic Chemistry. The research facilities within the School of Pharmacy are located in three buildings within close proximity including the Health Sciences Facility II, Allied Health Building and the School of Pharmacy building. The faculty occupying these facilities have 50,000 NASF of total laboratory space. The core facilities, laboratory space and equipment are summarized below.

PHARMACOKINETICS-BIOPHARMACEUTICS LABORATORY (PBL)

Scientists within the Pharmacokinetics-Biopharmaceutics Laboratory (PBL) are recognized experts in pre-clinical and clinical pharmacokinetics, pharmacodynamics, human drug metabolism, and clinical efficacy evaluations. The laboratory is directed by Dr. Natalie Eddington, chair of the Department of Pharmaceutical Sciences. Over the last 15 years, the PBL has performed more than 50 clinical pharmacology studies, including bioavailability, bioequivalency, pharmacokinetic, pharmacodynamic, and special populations (e.g., renal dysfunction, women, menstrual cycles, and genetic polymorphism). The PBL was instrumental in performing the fundamental studies that are the basis for the following FDA Regulatory Guidances including: SUPAC-MR (Scale Up and Post Approval Changes for Modified Release Formulations), SUPAC-IR (Scale Up and Post Approval Changes for Immediate Release Dosage Forms) and In Vitro-In Vivo Correlation (IVIVC). Each of these guidances has been supportive in streamlining the drug development process. As stated, the PBL has conducted numerous pre-clinical, translational and clinical studies in collaboration with the pharmaceutical industry, NIH and the FDA. Further, the laboratory currently holds grants and/or contracts that focus on mechanisms of drug delivery, disposition, drug efficacy and surrogate biomarker assessments.

The PBL has over 6,000 square feet in wet laboratory space and is equipped to perform cell-culture, animal studies, bioanalytical analysis, and mathematical modeling. The laboratory is well versed in data analysis techniques including pharmacokinetic modeling, physiological-based pharmacokinetic modeling, linked and indirect pharmacokinetic-phar-

macodynamic modeling, and population analysis. Software used for these analyses include ADAPT II, Winnonlin, NONMEM, SAS, Winnonmix and MATLAB. The PBL possesses the analytical equipment required for analysis of drugs in biological matrices. Facilities include fully automated high pressure liquid chromatograph including UV, fluorescence and electrochemical detectors, automated gas-liquid chromatograph with N-P and electron detectors, spectrophotometers, solid crystal and liquid scintillation counting equipment for enzyme and/or radioimmunoassay, LC/MS and LC/MS/MS. Analytical methods are developed and validated based on FDA guidances and GLP principles.

INDUSTRIAL PHARMACEUTICS LABORATORY

Scientists within the Industrial Pharmaceutics Laboratory are internationally recognized researchers in the design and optimization of oral dosage forms, including capsules, tablets, and emulsions. The IPL is directed by Dr. Larry Augsburger, Ralph Shangraw Professor of Pharmaceutics. Dr. Augsburger has performed formulation research for over 25 years and is an internationally recognized leader in this area. Research performed in this laboratory was instrumental in developing Regulatory Guidances for the Food and Drug Administration. In addition, these scientists have authored more than 150 referred articles in systematic formulation development and focusing on understanding both the principles of the drug delivery system and how the interplay of formulation and process variables impacts on dosage form manufacturability and drug delivery performance. The laboratory is equipped to perform preformulation research, excipient screening, and physical characterization of polymorphs, formulation of capsules and tablets, and the evaluation of these dosage forms using USP dissolution apparatus. Equipment in the Industrial Pharmaceutics Laboratory includes instrumented tablet presses and capsule filling machines, Automated Dissolution apparatus, moisture analyzers, particle density analyzer, Flodex powder tester, particle sizer, hardness/tensile strength testers, pH meters, HPLC systems, pore size analyzer, ICH stability chambers, Instron physical testing machine, surface area analyzer, zeta reader, HiCoater, Stokes B-2 rotary press, Fitz Mill M-5, Colton rotary press, Quadro Cone Mill, Manesty Beta Press, Zanasi LZ 64 Capsule filler, H and H Automatic Capsule filler, and Littleford High Shear Granulator.

MASS SPECTROSCOPY CORE FACILITY

The School of Pharmacy has a centralized Mass Spectrometry facility housed in the new Health Sciences Facility II, which can be employed to readily determine the molecular mass of novel small molecules as well as proteins and DNA resulting from proteomics studies. The central facility is equipped with a liquid chromatography mass spectrometer (LC/MS) and a matrix-assisted laser desorption ionization time-of-flight (MALDI-TOF) spectrometer. The Thermo Finnigan LCQ LC/MS is ideally suited for the quantitative analysis of small molecules (up to 2 kDa) in biological liquids and molecular mass determination of novel chemical entities, such as synthetic molecules resulting from a drug discovery program. The Bruker Daltonics OmniFlex™ MALDI-TOF is a mass spectrometer with reflectron and post-source decay (PSD) capabilities. This high-throughput equipment (100 sample ion source) is capable of accurately and rapidly determining the mass of high molecular weight molecules (peptides, proteins, DNA, synthetic polymers) up to 80 kDa. The reflectron option increases the resolution and accuracy of this particular machine three- to four-fold over conventional MALDI-TOF equipment. The PSD module allows the investigator to perform MS/MS analysis by selecting peptide fragments for subsequent peptide fragmentation. The Biotools software for protein data interpretation enables protein fingerprinting for identifying novel proteins originating from proteomics approaches. Further, this equipment can be employed to determine protein-protein, protein-DNA and protein-RNA interactions.

CONFOCAL MICROSCOPY CORE FACILITY

A fluorescence microscopy and confocal laser scanning microscopy (CLSM) core facility is housed in the School of Pharmacy. The CLSM unit is a Nikon Ci tethered to an E800 upright and a TE2000E fully motorized microscope. The Ci can be used for most confocal applications with a wide choice of fluorochromes, such as "green" fluorescence protein (GFP) imaging, time-lapse experiments, co-localization studies and live-cell imaging. The Ci confocal system scans four channels (three fluorescence and one transmitted light) simultaneously, and consists of an Argon laser (488nm) for detection of FITC, BODIPY, GFP, and Oregon Green dyes, and two Helium Neon lasers—Green (543nm) for detection of TRITC, PI; and Yellow (594nm) for Texas Red.

SYNTHETIC CHEMISTRY CORE

The Synthetic Chemistry Core is housed in the School of Pharmacy and focuses on support of translational research in order to synthesize small molecules and peptides. A significant part of this effort involves research in the area of drug discovery and development. To date, research in the area of drug discovery has involved collaboration of various biologists, structural biologists, synthetic chemists and the School of Pharmacy Computer-Aided Drug Design (CADD) Center. Scientists within this core have over 15 years of experience in the design and synthesis of small molecules and peptides. The core occupies over 1,000 square feet and possesses all relevant synthetic instrumentation including Buchi rotary evaporators, Aldrich vacuum manifold, Savant VP 100 vacuum pump, Welch vacuum pump, Mel-temp melting point apparatus, Lab-line vacuum oven and VWR flammable solvent cabinet.

COMPUTER-AIDED DRUG DESIGN (CADD) CENTER

Center capabilities include performing database screening against the crystal structures of target proteins or nucleic acids using a virtual database of 3 million commercially available low molecular weight compounds. Typically, database searching will select 100-200 compounds for biological assay, from which a collection of five to 10 lead compounds with activities in the micromolar range will be identified. These compounds can then be subject to lead optimization using, in part, CADD capabilities. Lead optimization involves systematically modifying the structure of the lead compound and determining which modifications will enhance the biological efficacy. The most promising modifications of the lead compounds are then synthesized and subjected to biological assay. This combination of CADD, synthesis and biological assay may be performed in an iterative fashion to further improve the biological efficacy. This iterative methodology is often performed in concert with structural biology from which 3D structures of the drug receptor complex are experimentally determined to validate and help direct the CADD efforts. In addition, CADD Center capabilities include structure-activity relationship (SAR) based methods that may be used to rationally improve the biological efficacy of a compound when the structure to the target protein or nucleic acid is unknown. These methods apply state-of-the-art molecular mechanics and molecular dynamics approaches as well as quantum mechanical methods.

X-RAY CRYSTALLOGRAPHY FACILITY

The technique of macromolecular crystallography is the principal foundation on which rational drug design is based. High-resolution crystal structures of lead compound inhibitors bound to active site cleft have allowed the rational design of improved inhibitors. Notable success stories include the development of HIV protease and influenza neuraminidase inhibitors. More recently, broader screens based on the combination of computational docking procedures combined with a biological screen have resulted in larger numbers of lead compounds in a typical drug development study. The HIV protease endeavor demonstrated that lead compound inhibitors often interact with target proteins in unexpected ways. It is therefore essential that the location and means by which a lead binds to the target compound is confirmed. The methods of choice for this would be NMR or crystallography. Both methods have their advantages and are in many ways complementary. The principal disadvantage of crystallography is that potential lead compounds may inhibit crystallization of the target protein. However, the advantage of protein crystallography is that when crystals are obtained the resulting structures can be very accurate thus allowing the 'fine tuning' of the lead compound in question.

The UMB X-ray crystallography laboratory is equipped with a new generation high flux narrow beam Micromax-7 X-ray generator and associated Raxis-IV++ detector ideally suited to rapid in-house crystal screening and data collection. Crystals are routinely maintained at cryogenic temperatures using an Oxford Cryosystems freezing device, and are mounted in an inverse phi orientation to allow convenient storage of crystals. The laboratory can accommodate virtually all crystal forms but is ideally suited to medium to small sized crystals (300 to 50 μm) with unit cells of 300 Ångstroms or less. The associated Crystal Clear software is user friendly and offers rapid crystal screening strategies with virtually automated data collection and processing.

SCHOOL OF PHARMACY EQUIPMENT

The School of Pharmacy has over 50,000 NASF of laboratory space. This includes 65 molecular biology suites, 20 chemistry laboratories suites (three of which are double suites), eight animal laboratories within an AALAC-approved animal facility, NMR Suite with control room, X-ray Crystallography Suite, Mass Spectroscopy Suite, Molecular Modeling/Computational Chemistry Laboratory, six cold rooms, two autoclave dishwashing rooms, six tissue culture rooms, numerous equipment rooms, a dark room, and a hydrogenation facility. Equipment and instrumentation in the School of Pharmacy include Ionization time-of-flight (MALDI-TOF) Mass Spectrometer, 500 MHz NMR with 5mm PFG Triple Resonance chili-Probe & 5mm Penta Probe, RAXIS-IV++/RP Imaging Plate System, X-ray Crystallography System Gen Micromax with Raxis Imaging Plate System, five Avanti J-20XPI Centrifuges, Optima L-100 XP Ultracentrifuge with 100 Ti Rotor and two Swinging Titanium Bucket Rotors, eight Z400 Superspeed Centrifuges, 14 CO₂ Air-Jacketed incubators, 10 Upright -86 degree Ultra low freezers, 8 -30 Upright Forma Freezers, Kodak X-Omat 2000A processor, seven ice machines, RAID System with Tape Library with optical storage units, Nikon C1 Confocal System, Array 10 water polishing units, X-ray Diffraction Unit, XX CO₂ Incubators, Glassware Washers with RODI water, SPECTRAMax Microplate Reader with SOFTmax Pro Software with Lmax Luminometer, iCycler Thermal Cycler with Optical Upgrade with real time analysis during PCR, Two LS 6500 Liquid Scintillation Counter, HPP5001 High Performance Particle Analyzer, 14 Sterilgard III Class 2 hoods for Tissue Culture, FPLC, Phosphorimager, Real Time PCR, 15 Waters HPLC with dual wavelength detector and with Multi-channel Fluorescence detector, numerous new microscope/imaging systems, and Glove Boxes.

Extramural funding for research is currently almost \$5 million and ongoing investigations include collaborative projects with other researchers on campus and at the FDA, NIH, Johns Hopkins University, Walter Reed Army Institute of Research, and the pharmaceutical industry. Projects include biotechnology related pharmaceutical science research involving molecular biology; macromolecular structure, dynamics and drug design; pharmacology and neuroscience; and novel drug and gene delivery.

The Department of Pharmaceutical Sciences has one of the most modern industrial and pharmaceutical technology research and manufacturing facilities in the country. It has small-scale and pilot-scale equipment for the production of aerosols, parenterals, liquid, semi-solid, and solid dosage forms. There is a state-of-the-art analytical facility for basic and applied pharmacokinetic research and clinical research in hospitalized patients. The laboratory is equipped to investigate all phases of drug absorption and disposition in animals and/or humans. A Good Manufacturing Practice facility exists for small-scale manufacturing pharmaceuticals.

FINANCIAL SUPPORT

Financial support is available to students accepted into the program so that they can focus on graduate studies. Support includes a stipend (\$20,772 for year 2004 for Step I pre-candidates and \$21,772 for Step II candidates), tuition, health, and fees. Additional merit awards are given to the department's most outstanding students.

Competitive departmental fellowships are awarded by the department each year: Dunning Fellowship, Emerson Fellowship, Slama Graduate Award, and the Shangraw/Center for Professional Advancement Scholarship. Additionally, many students each year earn external fellowships, through excellence in academics and research.

POST-GRADUATE EDUCATION AND TRAINING

RESIDENCY AND FELLOWSHIP TRAINING PROGRAMS

The residency and fellowship training programs through the Department of Pharmacy Practice and Science are an important response to the demand for pharmacists with advanced clinical training in a variety of health care settings. The department currently offers residency and fellowship training programs in clinical toxicology, community pharmacy practice, drug information practice, geriatric pharmacotherapy, instructional design and evaluation, managed care pharmacy practice, palliative care, oncology pharmacy practice, pediatric pharmacy practice, primary care pharmacy practice, and psychiatric pharmacy practice. Each program is designed to give the resident a breadth of practical experiences that will enhance the trainee's clinical, research, and teaching skills. While the objectives of each program are slightly different, the goals of these training programs are to:

- Prepare individuals to assume leadership roles in pharmacy practice and science.
- Create progressive, educationally oriented practice settings in which pharmacists enhance their patient care, and administrative, teaching, and research skills.
- Foster the development of innovative patient care services.
- Promote professional, public, and political awareness of the important role that pharmacists play in providing health care services.
- Conduct applied research regarding pharmacy services that determines their impact on patient care in terms of clinical, humanistic, and/or economic outcomes.

For more information see www.pharmacy.umaryland.edu/pps/residents.



(left to right) Student Rachael Boyer checks a volunteer's blood pressure at UMB Legislative Week in Annapolis.



(left to right) Jennifer Mercado, Rachael Boyer, Ana Gonzalez, and Susanna Sowell at UMB Legislative Week in Annapolis.

STUDENT INFORMATION

COMMITMENT TO DIVERSITY

The School seeks an applicant pool and a student body that is diverse in race, sex, age, geographic and economic background, religion, and ethnicity.

COMPLIANCE WITH ADA LEGISLATION

In accordance with the Americans with Disabilities Act of 1990, the School examines all aspects of its programs and services to ensure accessibility to qualified students with disabilities. From recruitment to commencement, the School strives to create an environment that respects individual differences while challenging students to perform to their optimal ability.

HEALTH INSURANCE

University or equivalent health insurance coverage is required of all full-time students. Students will be billed for health insurance unless they provide proof of similar coverage to the Office of Student and Employee Health. If students provide documentation, the cost of the premium is waived. The cost of health insurance varies depending on the type of coverage. For information about health insurance, call Student Accounting at 410-706-2930 or visit the Administration Building, Room 313. Details are also online at www.umaryland.edu/health.

STUDENT HONORS AND AWARDS

In the spring, the School honors its graduates. Students who graduate in the top 4 percent of their class, graduate with Summa Cum Laude honors, the next 5 percent, Magna Cum Laude, and the next 6 percent, Cum Laude. Faculty members present the following academic-achievement awards to members of the graduating class at the spring Graduation Convocation.

Alpha Zeta Omega Fraternity Prize, Kappa Chapter. The Kappa Chapter of the Maryland Alumni Chapter of the Alpha Zeta Omega fraternity provides a prize that is awarded to a student for proficiency in pharmacology.

Andrew G. DuMez Award. In memory of Dr. Andrew G. DuMez, former dean and professor of pharmacy, the DuMez award is given to a student for superior proficiency in pharmacy.

Lambda Kappa Sigma-Cole Award, Epsilon Alumnae Chapter. A student receives this award in memory of Dr. B. Olive Cole, former acting dean, for proficiency in pharmacy administration.

The Excellence in Pharmaceutical Care Award. The Nontraditional PharmD Pathway preceptors and mentors give this award to a student who has excelled in his/her practice setting.

School of Pharmacy Academic Excellence Awards. The students who receive this award have attained the highest general average in the entry-level program and in the Nontraditional PharmD Pathway.

William Simon Memorial Prize. In honor of the late Dr. William Simon, a professor of chemistry in the School for 30 years, a student is awarded a prize for superior work in the field of biomedical chemistry.

Frank J. Slama Award from the School's Alumni Association. In tribute to Dr. Frank J. Slama, Class of 1924, a former professor and head of the Department of Pharmacognosy, for over half a century of loyalty and service to his profession, to the School, and to the Alumni Association, the School's Alumni Association gives this award to a member of the graduating class who excelled in extracurricular activities.

Dr. and Mrs. Frank J. Slama Scholarship Fund. In memory of her husband, Dr. Frank J. Slama, former distinguished professor in the School of Pharmacy, Lillian Slama established this scholarship on Aug. 12, 1975. A student receives this award for superior work in the field of biopharmacognosy.

Wagner Pharmaceutical Jurisprudence Prize.

In memory of her husband, Manuel B. Wagner, and her son, Howard J. Wagner, both alumni of the School, the late Mrs. Sadie S. Wagner, and her daughter, Mrs. Phyllis Wagner Brill Snyder, fund a prize to a graduating student for meritorious academic achievement in pharmaceutical jurisprudence.

John F. Wannenwetsch Memorial Prize. In memory of her brother, Dr. John F. Wannenwetsch, a distinguished alumnus of the School, Mrs. Mary H. Wannenwetsch funds a prize given to a graduating student who has exhibited exceptional performance and promise in the practice of community pharmacy.

The Conrad L. Wich Pharmacognosy Prize.

In appreciation of the assistance that the Maryland College of Pharmacy extended to him as a young man, Mr. Conrad L. Wich provided a fund. The faculty assembly awards annually the income from this fund to a student who has done exceptional work throughout the course in pharmacognosy.

L.S. Williams Practical Pharmacy Prize. A bequest provided by the late L.S. Williams funds the L.S. Williams Practical Pharmacy Prize given to the student having the highest general average throughout the course in basic and applied pharmaceuticals.

STUDENT ORGANIZATIONS

The School has 18 student organizations, including fraternities, professional pharmacy organizations, honor societies, a high school tutoring/mentoring program, and social organizations that perform a variety of services and activities for the profession and the community. The organizations operate under the auspices of the Student Government Association. Further information is available at www.pharmacy.umaryland.edu/studentorg/default.htm.

PHARM D STUDENT GOVERNMENT ASSOCIATION (SGA)

The SGA promotes the professional development of students through the process of self-government. The SGA strives to develop academic achievement, to encourage communication between faculty and students, to coordinate activities within the School, to promote educational programming, to enhance professional and social interests, and to encourage

community service. All students belong to the SGA. The Executive Council of the SGA is composed of SGA officers, presidents of organizations, class officers, and the yearbook editor; and the council is vested the executive, legislative, and judicial power of the SGA. The council meets periodically with School administrators to discuss important issues. At the campus level, the University Student Government Association (USGA) coordinates the activities of the Graduate School and the six professional schools. USGA representatives are elected by the students of all seven schools.

PHARMACY GRADUATE STUDENT ASSOCIATION

Graduate students play a particularly active role in a number of campus student organizations. Additionally, two graduate student organizations within the School of Pharmacy and the Department of Pharmaceutical Sciences are the Pharmacy Graduate Student Association and a student chapter of the American Association of Pharmaceutical Sciences. Moreover, depending upon their specific research interests, individual students often join national professional societies, many of which host meetings and workshops in the mid-Atlantic region.

The purpose of the Pharmacy Graduate Student Association (PGSA) of the University of Maryland School of Pharmacy is: 1) to act as an official liaison body to communicate graduate student concerns to the pharmaceutical sciences and pharmacy administration officials of the School; 2) to provide a platform for discussions and suggestions on matters involving graduate students; 3) to communicate and support research interests of graduate students of the School; 4) to promote efficient recruitment and orientation of incoming graduate students; 5) to promote a better graduate student life; 6) to represent the interests of graduate students as members of university-wide organizations; and 7) to recognize, foster, and reward outstanding leadership among individuals who promote PGSA ideals.

FINANCIAL INFORMATION

The School's tuition and fees, health insurance, residency status, and financial aid information is as follows:

TUITION AND FEES

Tuition and fees for the current academic year can be found on the Student Accounting Web site at www.umaryland.edu/institutionalresearch/tuition. Nontraditional PharmD Pathway and graduate students pay tuition per credit hour regardless of the number of credit hours taken.

**Late payment of tuition and fees is \$100 or 5 percent of the balance, whichever is less. NOTE: Notwithstanding any other provision of this or any other University publication, the University reserves the right to make changes in tuition, fees and other charges at any time such changes are deemed necessary by the University and the University System of Maryland Board of Regents.*

LATE REGISTRATION

Students who fail to complete registration by the specified deadline, pay a late registration fee of \$75 per transaction.

DETERMINATION OF IN-STATE RESIDENCY

The Office of the Registrar makes an initial determination of residency status for admission and tuition when students apply for admission. The determination made at that time, and any determination made thereafter, shall prevail for each semester until the student changes the status. Students classified as in-state residents are responsible for notifying the Office of the Registrar in writing within 15 days of any change in their circumstances that might in any way affect their classification at the University. Students may obtain a copy of the University's policy on in-state residency status from www.umaryland.edu/orr/ or by calling 410-706-7480.

PHARM D STUDENT FINANCIAL AID

The Office of Student Financial Aid centrally administers student financial aid programs. These programs are designed to help students who otherwise would be unable to attend the University. Aid packages for students often include a combi-

nation of loans, grants, scholarships, and work-study designed to meet students' needs. To qualify for aid, students must apply annually and meet the eligibility requirements. Also, students must complete the required financial aid application forms. For more information about financial aid and to obtain application forms, call 410-706-7347/800-735-2258 (TTY/Voice), visit www.umaryland.edu/fin or write to the Office of Financial Aid, 111 S. Greene St., Baltimore, MD 21201.

SCHOOL OF PHARMACY SCHOLARSHIPS

Through the generous gifts of alumni, friends, and professional associations, the School provides additional financial aid to its full-time students who are in need of financial support. Students do not apply for these awards. Students who receive most awards are those who can document unmet financial need through the student financial aid process. Some scholarships support students from certain geographical areas. The School has established the following scholarships:

April Adams Memorial Scholarship. The students, faculty, and friends of April Adams established this scholarship as a lasting tribute to Adams, Class of 1999. The scholarship, symbolizing her dedication to and love of pharmacy, will be awarded to deserving students in her name.

Marilyn I. Arkin Scholarship Fund. The family and friends of Marilyn I. Arkin, daughter of Ann and Morris Arkin and a member of the Class of 1975, established this scholarship as a memorial in 1988. The scholarship provides support for professional students in the School of Pharmacy.

The Yvette Beakes Memorial Scholarship. Family, friends, classmates and faculty established this scholarship in June 2002 as a memorial to Yvette Beakes, Class of 2000 PharmD graduate. The scholarship provides support for financially needy professional students who have made contributions to community or health care causes.

The Beardsley Scholar Leader Scholarship Fund. Established in January 2005 by Drs. Robert S. and Katherine P. Beardsley, this fund provides support for third-year students enrolled in the Doctor of Pharmacy program who demonstrate academic achievement, financial need and significant leadership ability.**

The Boyle Legacy for Advocacy Scholarship Endowment. Established in February 2005 by Dr. Cynthia J. Boyle in memory of John E. Boyle, this fund provides scholarship support to students after completing at least the first year of the PharmD program, enrolled in the Doctor of Pharmacy program who have demonstrated academic achievement, financial need, and an aptitude for advocacy for the profession or public health and participated as active members of a professional pharmacy organization.**

Caspari Memorial Fund. Alumni and friends of Professor Charles Caspari, Jr., former dean of the School of Pharmacy, established this scholarship Nov. 25, 1917, to support a deserving student who has financial need.

Centennial Research Fund. This fund was established Sept. 13, 1946, with contributions from the Centennial Research Fund campaign launched in 1941 to commemorate the 100th anniversary of the School of Pharmacy. The students who receive this fellowship do research in the following fields: pharmacy, pharmaceutical chemistry, pharmacology, microbiology, and pharmacognosy.

H.J. (Jack) Custis, Jr., Memorial Scholarship Fund. In memory of H.J. (Jack) Custis, Jr., Class of 1951, a fund was established to award scholarships on the basis of reasonable need and academic ability to students in the professional program of the School of Pharmacy. Students must be residents of one of Maryland's nine Eastern Shore counties to be eligible for the Custis Memorial Scholarship.

H.A.B. Dunning Fellowship Fund. This fund was first established from annual donations beginning in 1930 and endowed in 1963 by bequest to the School of Pharmacy from Dr. H.A.B. Dunning, distinguished alumnus of the School and prominent Baltimore manufacturing pharmacist. This fellowship is open to promising graduate students doing research in pharmaceutical chemistry.

Isadore M. and Irene R. Fischer Memorial Scholarship Fund. The families of Isadore M. and Irene R. Fischer have provided a scholarship fund to support a professional or graduate student demonstrating academic excellence in the educational programs of the University of Maryland School of Pharmacy.

Charles L. Henry Memorial Scholarship Fund. The Charles L. Henry Memorial Scholarship Fund has been provided for PharmD students in the School of Pharmacy requiring financial assistance.

L. Louis and Elinor Hens Memorial Scholarship Fund. Established in 1990 by Mrs. Elinor Hens in memory of her husband, this fund is used to support deserving students who have financial need.

Dr. Paul Jablon Research Award. Mr. Leon Jablon and the late Mrs. Yetta Jablon established this award in January 1985 in memory of their son, Dr. Paul Jablon. The research award is given to students displaying exceptional promise in the field of pharmaceuticals.

J. Gilbert Joseph Scholarship. In memory of her brother, J. Gilbert Joseph, a former student of the School of Pharmacy, the late Miss Jeanette Joseph provided a generous bequest to endow scholarships to be awarded to qualified students who have maintained a superior scholastic average and who are in need of financial assistance.

Frederick William Koenig Memorial Scholarship. In memory of her husband, Frederick William Koenig, a practicing pharmacist for 50 years, the late Mrs. Valeria R. Koenig has bequeathed a sum of money to endow a scholarship to be awarded annually. The recipient of the award will be selected on the basis of financial need, character, and scholarship.

The Bernard Lachman Memorial Scholarship Fund. The family, friends, and colleagues of Bernard Lachman established this fund in 1999 in his memory. The scholarship is used to support students who have financial need.

Dr. Dean E. Leavitt Memorial Scholarship Fund. In honor of Dr. Dean E. Leavitt, associate dean for administration and professional services, 1976–1989, the family and the faculty established a fund to support a scholarship covering the final year of pharmacy school for students who have attained at least a cumulative average of 3.0, who have shown superior aptitude and enthusiasm in the course sequence in management, and who have demonstrated, as Dean Leavitt did, a commitment to the qualities of health and humanitarianism, both personally and professionally.

A.M. Lichtenstein Scholarship. In memory of her husband, A.M. Lichtenstein, distinguished alumnus of the School of Pharmacy, Class of 1889, the late Mrs. Francina Freese Lichtenstein bequeathed a sum of money to endow an annual scholarship to a resident of Allegheny County, Maryland. The recipient of the award is to be selected on the basis of financial need, character, and scholarship.

The Eugene J. Lovito Scholarship Fund. This fund was established in 2004 by long-time staff member Phyllis Lovito in honor of her father. This fund provides support to an academically talented third-year student with demonstrated financial need, outstanding skills in patient care and contributions to community or health care causes.**

The Dr. L. Lavan Manthey Scholarship Fund. This fund was established July 8, 1997, in memory of L. Lavan Manthey, PhD, Class of 1926, and winner of the Simon Gold Medal for proficiency in practical chemistry in 1928. The scholarship is used to support students who have financial need.

Aaron and Rosalie Paulson Scholarship Fund. Established by Mr. Aaron A. Paulson, Class of 1924, and his late wife, Rosalie, this endowed scholarship supports a first professional year student with demonstrated financial need.

Plough Pharmacy Student Scholarships. The Plough Foundation, created by Abe Plough, founder of Plough Inc., and the School of Pharmacy, contributed funds to an endowment that provides financial support to pharmacy students. The funds are awarded on the basis of financial need, academic achievement, leadership, and citizenship.

Leonard Rodman Dean's Scholarship Fund. Established in March 2001 by Mr. Leonard Rodman, this fund is used to provide a scholarship to support students who have financial need.

Milton C. and Elizabeth C. Sappe Scholarship Fund (formerly the Milton Charles Sappe Scholarship Fund). Elizabeth Sappe established this scholarship in December 1995. The scholarship is used to support students who have demonstrated financial need, high academic standing, and are residents of Maryland.

Joseph Sokol Memorial Scholarship. In memory of Joseph Sokol, Class of 1973, his family and friends established this scholarship to provide support for deserving students who have financial need.

Arthur Schwartz Memorial Scholarship Fund. The family and friends of Arthur Schwartz, BS Pharm 1979, PhD Pharmacy Administration 1987, have established an endowed scholarship fund for a graduate student in Pharmacy Administration to honor his memory.

Dr. Frank J. Slama Fellowship Fund. Established in April 1996 from the estate of Lillian Slama, in memory of her husband, Dr. Frank J. Slama, this fellowship supports one or more annual award(s) for graduate students studying medicinal chemistry and/or pharmacognosy.

**This fund is part of the portfolio of endowed scholarships and fellowships for pharmacy students to be called the Presidential Scholarship Program for Pharmacy Students, which was established to honor the leadership of David J. Ramsay. A matching fund gift from John M. Gregory will be used to augment donations to the fund and other funds in the portfolio.

LOAN FUNDS

Students in financial need may apply for the School loans described below. For more information, contact the associate dean for student affairs at 410-706-7653.

Rose Hender Memorial Fund. L. Manuel Hender and family have established a loan fund in memory of Mrs. Rose Hender for needy students. Loans from this fund are available to qualified students.

Louis T. Sabatino Memorial Student Loan Fund. In honor and memory of her late brother, Louis T. Sabatino, Class of 1939, Mrs. Marie Sabatino DeOms has established this fund to provide loans to deserving students.

Benjamin Schoenfeld Memorial Pharmacy Loan Fund. The family of Mr. Benjamin Schoenfeld, Class of 1924, has established a loan fund as a memorial to him. This fund is available to qualified needy students. Loans are made upon the recommendation of the dean.

Burroughs-Welcome Emergency Loan Fund. The Burroughs-Welcome Co. established a fund to provide short-term (two months) loans to students in financial need.

VETERANS FINANCIAL AID

New students who are eligible for educational benefits through the Veterans Administration should forward a completed VA Form 22-1995: Request for Change of Program or Place of Training to the Office of Student Affairs. Veterans who have not used any of their VA educational benefits should forward a completed VA Form 22-1990: Application for Program of Education or Training and a copy of DD 214: Separation Papers directly to:

Office of Student Affairs
University of Maryland
School of Pharmacy
20 N. Pine St., Room 224
Baltimore, MD 21201

PHD STUDENT FINANCIAL AID

For information on financial support, graduate students should contact the graduate department to which they are applying.



Pharmaceutical Sciences post-doctoral students work on a variety of research projects.



PHARMD POLICIES AND PROCEDURES

The School reserves the right to make changes in requirements for admission, curriculum, standards for advancement and graduation, fees, and rules and regulations. The following policy statements shall not be construed as a contract between any student and the School of Pharmacy.

REGISTRATION POLICIES

ACADEMIC SESSIONS

The School of Pharmacy's academic calendar is as follows: the fall semester, four months beginning the last week of August through mid-December; a winter minimester, three weeks in January; and the spring semester, four months beginning late January through the end of May. The School does not offer a summer session. Full-time students enrolled for the spring semester do not pay tuition and fees for courses taken on the UMB campus during the January minimester. Students must pay additional minimester tuition at other University System of Maryland (USM) campuses. Students may take didactic courses at USM institutions but must pay summer session tuition and fees directly to the institutions they attend. For up-to-date information about the academic calendar and registration, see www.pharmacy.umaryland.edu/studentaffairs/registration/registration.htm.

CANCELLATION OF REGISTRATION

Students who register and subsequently decide not to attend the School of Pharmacy must provide written notice to the Office of Student Affairs on or before the first day of class. If this office has not received a request for cancellation by 5 p.m. on or before the first day of instruction, the University will assume that students plan to attend and that they accept their financial obligation.

CHANGE IN REGISTRATION

All registration can be entered during Web registration from the beginning of advanced registration until three to four weeks before the start of classes (see academic calendar at www.pharmacy.umaryland.edu/calendars/). Students can ADD classes up to the first week of instruction and DROP classes four weeks after the start of classes.

NOTE: These deadlines are inclusive of ALL CLASSES at the UMB campus, whether or not they start at different times during the semester.

In unusual instances, after the deadline, transactions must be submitted directly to the Office of Student Affairs, using the *Change in Registration Form* with approval of the coursemaster. These types of changes will not incur a fee.

LATE REGISTRATION

Students who fail to complete registration by the specified deadline, pay a late registration fee. (See the *Financial Information* section of this catalog for fee amount.)

TRANSFER COURSEWORK POLICY

Students are allowed to transfer up to 6 credits of didactic elective coursework completed at a four-year institution. Prior approval must be obtained from student's advisor and the Office of Student Affairs.

ACADEMIC STATUS POLICIES

I. DEFINITIONS

- "associate dean" refers to the associate dean of student affairs
- "chair" refers to the Student Affairs Committee chair
- "committee" refers to the Student Affairs Committee
- "dean" refers to the dean of the School of Pharmacy

II. GENERAL

A. Grading Policies

- As per University policy, the School of Pharmacy uses the following grading system:

GRADE	INTERPRETATION	GPA POINT VALUE
A	Excellent	4
B	Good	3
C	Fair	2
D	Weak but passing	1
P	Pass	NA
F	Failure	0
I	Incomplete (one year to remove)	NA
NM	No mark	NA
WD	Withdraw from program	NA

- When, for any reason, students repeat courses, grades achieved in the repeated courses will replace all previous grades in the same course.

B. Use of "NM" and "I" Grades.

- An Incomplete ("I") grade at the end of the grading period indicates that (a) a student has not completed all elements of a particular course that are calculated into the final grade for that course, and (b) the student has received permission from faculty to continue to work on these elements. If the student has not made arrangements with faculty for an extension beyond the semester, a failing grade must be recorded. When an "I" is awarded, the faculty and student must complete a *Plan of Action* Form that outlines the steps to be taken to remove the "I." Incomplete grades must be resolved within one year following the date the original grade was awarded. Extensions may be granted for extenuating circumstances.

- A No Mark ("NM") is the default grade that is given when faculty members cannot award letter grades at the end of the grading period. Reasons for "NM" grades include: course content did not conclude during that semester; faculty were unable to calculate final grades; or final assessments were not completed at the time grades were due.
- In summary, "I" grades reflect issues involving student ability to complete course requirements, while "NM" grades indicate that faculty are unable to record letter grades at the end of the grading period due to course related issues. Both students and faculty are responsible for resolving grading issues as soon as possible.

C. Absences

Students are granted excused absences for documented physical and mental health issues. Granting excused absences are made on an individual basis in consultation with the Office of Student Affairs, faculty advisors, and each coursemaster. The School's goal is to provide a climate conducive to learning for all students and to maintain a rigorous academic program while assuring professional responsibility, equity, and respect for the needs of individuals.

- Requests for excused absences must be in writing to each coursemaster before arrangements are made to make up missed exams and assignments. Requests must include the nature of the illness, treatment plan, expected length of absence, a plan to make up missed assignments/exams, and documentation from the student's caregiver. The ability to return successfully after an extended absence is based on numerous factors including the type of illness, the type of treatment, when the absence occurred, the student's past academic performance, and the type of assignments/exams missed. The student's caregiver may be asked to help determine a reasonable course of action. Faculty will attempt to accommodate student needs, but must consider academic integrity and other issues when considering the request. If coursework cannot be completed by the end of the semester, the student will receive an "I" grade and will make arrangements with faculty to resolve remaining academic issues.

2. Experience has shown that it is difficult to return to school after missing two to three weeks of classes. Students may be better served to request a **leave of absence** from the program if their situation involves absences of greater than three weeks. Students must request a leave of absence in writing to the Office of Student Affairs. If granted, the student will prepare a Plan of Action documenting his/her future plans including when he/she plans to return to the School. Students must also contact individual coursemasters and their academic advisor when their leave is approved. A copy of the leave approval will be retained in the student's file.
3. Students who receive more than one D-grade in a given semester in required courses, but are not eligible for academic dismissal, will be invited to an academic hearing with the committee.
4. Students who earn a **semester GPA** below 2.0 but maintain a **cumulative GPA** of 2.0 or greater will receive a letter of academic warning from the Office of Student Affairs.
5. Students must pass all first- and second-year courses before advancing into the third year; and all third-year courses before advancing into the fourth year. Students must also pass prerequisite courses before taking related advanced courses.

D. Withdrawal from Program

Students may choose to withdraw from the program for a variety of reasons. Requests of withdrawal must be in writing to the Office of Student Affairs. The office will notify University officials, academic advisors, and other faculty members. Notation of the withdrawal will be retained in the student's file. Students may receive partial refunds from the University based on campus policies. Students who fail to complete an official request for withdrawal will receive failing grades in all courses.

III. ACADEMIC REVIEW PROCESS

Student performance in didactic and experiential learning courses is monitored on a continual basis. Students are responsible for their own academic progress. Students should take the initiative to meet with their academic advisor, their coursemasters, and the Office of Student Affairs when academic problems occur. Experience has demonstrated that the more active a student is in recognizing and addressing potential problems early, the greater the likelihood of avoiding academic difficulties. By the same token, faculty members are encouraged to initiate discussions with students whose performance is likely to result in a failing grade.

A. Academic Requirements

1. Students who receive a failing grade in any course (required or elective, didactic or experiential) are eligible for academic dismissal as soon as the failing grade is submitted in writing to the Office of Student Affairs.
2. Students who have a cumulative GPA below 2.0 in **required** courses at the end of each semester are subject to academic dismissal.

B. Review Process for F-grades or GPA < 2.0 in Required Courses

1. At the end of each semester, the associate dean and the chair will review the academic status of all students enrolled in the Doctor of Pharmacy program. They will identify all with failing grades and/or GPA < 2.0 in required courses. They will send both e-mail and post-mail letters to each student indicating the time and place for an academic review hearing with the committee (typically within 10 calendar days of the letter's date). The Office of Student Affairs will make attempts to personally contact each student if a response to the letter is not received within 48 hours. A copy of the letter will be sent to the student's academic advisor, and a copy will be retained in the student's file. Students will be directed to the appropriate documents on the Web describing the academic review process.
2. Students eligible for academic dismissal have the right to appeal to the committee. Students may present their case in person before the committee or submit a written appeal. As part of their appeal, students may submit any other documents that they deem pertinent. Individuals from outside the School may make a brief statement on behalf of the student, but are not allowed to remain in the hearing due to the confidential nature of the meeting. Academic advisors and other faculty members may attend academic review hearings and present pertinent information. In their appeal, students should focus on the circumstances leading to their weak academic performance and strategies they will use to assure future success. The committee will consider pre-pharmacy grades, prior academic performance in the school, and personal issues in its deliberations. Students who do not

- appeal will be academically dismissed from the School. In the rare instance that a student does not receive notification of the hearing despite the efforts outlined previously, and upon discovery of such information, the committee will reverse the dismissal and reassign a new hearing date.
3. Prior to committee academic review hearing (typically 10 calendar days), a confidential message from the chair will be distributed to the faculty listing all students to be reviewed. The memo will state the specific place and time of the hearing. The memo will request faculty to voluntarily provide information to the committee regarding each student's academic performance and ability. Any faculty member may provide written comments to the committee or request permission to appear at any student's hearing. The memo will stress the confidential nature of the information.
 4. *Possible Committee Action.* At the conclusion of the academic review process, the committee will deliberate on each case and will vote on a course of action (by a simple majority of committee members present).
 - a. In situations where successful completion of the PharmD program is in doubt, the committee will *academically dismiss* the student.
 - b. In situations where the student shows promise of resolving issues and continuing successfully in the program, the committee will act as follows:
 - (1) *For failing grades in required courses or for GPA < 2.0 in required courses:* The committee will place the student on *academic probation*. The length of the probation is typically determined by when the failing grade is removed or the required GPA improves to above a 2.0. If placed on academic probation, the student will be allowed to continue in the program but under specific guidelines as outlined by the committee, such as taking remedial courses to strengthen specific knowledge or skills.
 - (2) *For failing grades in elective courses:* The student will be required to take additional coursework in order to accrue the necessary number of credit hours for graduation.
 - c. In some situations, the committee may *defer its decision* to gather more information, contact additional individuals, or wait for additional information from the student. If the committee decides to defer its decision, it should complete its review and make a final decision within five (5) calendar days of the original hearing.
5. *Notification of Decisions.* The committee will submit its decisions in writing to the dean and the student within seven (7) calendar days following the academic review hearings. A copy of the letter will be sent to the student's academic advisor, and a copy will be retained in the student's file.
 6. *Appeal to the Dean.* Students have the right to appeal the decisions made by the committee directly to the dean. Appeals must be in writing and must be based on 1) new relevant facts not produced in the hearing, 2) a claim of inadequate consideration of specific information by the committee, 3) a claim that the committee did not follow appropriate procedures, or 4) a claim that the committee's action was unduly severe. The dean's decision is final.
7. **Implementation of Committee Actions**
 - a. At the conclusion of the appeals process, final decisions will be permanently recorded on the student's official transcript. The chair will also develop a report for all faculty containing the student's name, reason for appearing before the committee, and final committee decision. The report will be posted in a secure location for viewing. Specific details regarding the decision will be kept confidential, but may be disclosed to individual faculty members if deemed appropriate by the associate dean or chair.
 - b. Students on *academic probation* must meet with their academic advisor, the associate dean, and the coursemaster of each failed course to develop a Plan of Action (to resolve all pertinent academic issues. A copy of this plan will be sent to the student's academic advisor, to the coursemaster, and a copy will be retained in the student's file.

- c. While on probation, students must earn a GPA of 2.0 or greater each semester. If a student on probation earns a semester GPA of 2.0 or greater, but the cumulative GPA or the required-course GPA remains below 2.0, the student will remain on academic probation.
- d. Students will be removed from probation when a failing grade in a required course is removed and their cumulative GPA and required-course GPA is 2.0 or greater.
- e. Students on probation must focus on their academic program and thus cannot hold office in a School-related organization or represent the School at outside events.
- f. Students who are *academically dismissed* may petition for readmission after they have completed some form of remediation suggested by the committee. Students who have been academically dismissed twice from the School are not eligible for readmission.

C. Review Process for Two D-grades in Required Courses in One Semester in Student Not Otherwise Eligible for Academic Dismissal

- 1. At the end of each semester, the associate dean and the chair will review the academic status of all students enrolled in the Doctor of Pharmacy program. They will identify all students receiving two D-grades in required courses in the same semester. They will send both e-mail and post-mail letters to each student indicating the time and place for an academic review hearing with the committee (typically within 10 calendar days of the letter's date). Students will be directed to the appropriate documents on the Web describing the academic review process.
- 2. Students identified will be asked to present their case in person before the committee or by writing. The purpose of the review is to identify areas of weakness that are leading to academic difficulty. These students are not eligible for academic dismissal.
- 3. *Committee action:* The committee will submit its recommendations in writing to the dean and the student within seven (7) calendar days following the academic review hearings. A copy of the letter will be sent to the student's academic advisor, and a copy will be retained in the student's file.

D. Review Process for No Mark and Incomplete Grades

- 1. At the end of each semester, the committee will review the academic records of students receiving "NM" or "I" grades in *required* didactic and experiential learning courses.
- 2. Student Affairs staff will contact faculty regarding the "NM" and "I" grades to discuss possible resolution. If experiential learning courses are involved, staff will contact the Experiential Learning Office for additional information. During this review time, coursemasters may elect to change "I" grades to failing grades if the "I" has remained on the record for longer than one year, and there are no extenuating circumstances preventing the student from removing the "I" grade. Coursemasters will submit a *Change of Grade Form* to reflect these changes.
- 3. Students must complete a Plan of Action outlining their plans to resolve "I" grades. A copy of this plan will be sent to the student's academic advisor, to the coursemaster, and a copy will be retained in the student's file. If students fail to submit these plans, their registration will be cancelled.

IV. READMISSION POLICIES

Students who have to leave the school for personal, disciplinary, or academic reasons have the right to request readmission to the Office of Student Affairs. The associate dean of student affairs and the chair of the Student Affairs Committee will review and act on the request. If they feel additional faculty input is needed they may refer the request to the committee for review and action. These requests will be handled in the following manner based on the reason for leaving the program.

A. Academic or Disciplinary Dismissal

Students who have been academically dismissed once may petition for reinstatement after they have completed some form of remediation. Students who have been academically dismissed twice are not eligible for reinstatement. The associate dean and chair will review the prepharmacy and pharmacy school academic backgrounds of students requesting readmission. Many times, specific plans of action have been formulated by the committee following dismissal. These plans will be reviewed to make sure that they

were followed. Based on this review, students may be called to meet with the associate dean, chair, and/or committee as deemed necessary. Requests for readmission should be made by June 1 for fall semesters and Nov. 1 for spring semesters.

B. Personal Reasons

Many times, students must discontinue their academic training due to personal or financial reasons. When students are ready to return to the School of Pharmacy, they must request reinstatement to the associate dean who will consider the request and may or may not place certain conditions on students upon their return. For example, if students have been on leave for lengthy time periods, then they may need to retake specific science courses to update their knowledge base. Students may be requested to retake certain key courses that may have changed or may be prerequisites to other courses. The key is to

make sure that students are well prepared to continue their studies. Students are required to meet with coursemasters in relevant courses upon their return to inform them of their status. Requests for readmission following a personal leave of absence are typically not reviewed by the committee. Requests for readmission should be made by June 1 for fall semesters and Nov. 1 for spring semesters.

PLAN OF ACTION TO REMEDIATE FAILING OR INCOMPLETE GRADES

Students who have failing or incomplete grades in required Doctor of Pharmacy courses on their official transcripts must prepare this Plan of Action to describe how they plan to remediate these grades to passing grades. This form must be signed by the coursemaster and will be kept on file in the Office of Student Affairs.

Plan of Action

Name: _____ Date: _____

SS#: _____ Class of: _____

Course: _____ Semester taken: _____

Coursemaster: _____ Current grade (please circle one): F or I

Plan to Remove Failing or Incomplete Grade: _____

To be resolved by: _____ Specific date: _____

_____ Date _____ Student Signature _____ Date _____

Coursemaster Signature

Date

Student Signature

Date

approved 5/6/05

ACADEMIC INTEGRITY POLICIES AND PROCEDURES

Students are entering a profession highly trusted by the public. Therefore, students are expected to "maintain the highest principle of moral, ethical, and legal conduct." (Oath of a Pharmacist, 1999.) Students and faculty developed the policies and procedures described below to help maintain the School's high standard of conduct.

STUDENT HONOR CODE

ACADEMIC INTEGRITY

Adhering to a philosophy of academic integrity compels students to place the highest significance on their learning, and on the academic work that they produce during their course of study.

ACADEMIC INTEGRITY VIOLATIONS

Violations of academic integrity can be categorized into six broad areas.

CHEATING

Cheating can be defined as *using or attempting to use unauthorized materials, information, notes, study aids or other devices, or obtaining unauthorized assistance from any source for work submitted as one's own individual efforts in any class, clinic, assignment, or examination.* Examples of cheating include, but are not limited to, the following actions:

- a. Copying from another student's paper or test, or receiving assistance from another person during an exam or other assignment in a manner not authorized by the instructor.
- b. Possessing, buying, selling, removing, receiving, or using at any time or in any manner not previously authorized by the instructor a copy or copies of any exam or other materials (in whole or in part) intended to be used as an instrument of evaluation in advance of its administration.
- c. Using material or equipment not authorized by the instructor during a test or other academic evaluation, such as crib notes, a calculator, tape recorder, PDA or other personal electronic device.
- d. Working with another or others on any exam, take home exam, computer or laboratory work; or any other assignment when the instructor has required independent and unaided effort.
- e. Attempting to influence or change an academic evaluation, grade or record by deceit or unfair means, such as: (1) damaging the academic work of another student to gain an unfair advantage in an academic evaluation; or (2) marking or submitting an exam or other assignment in a manner designed to deceive the grading system.
- f. Submitting without prior permission the same academic work that has been submitted in identical or similar form in another class or in fulfillment of any other academic requirement at the University.
- g. Permitting another to substitute for one's self during an exam or any other type of academic evaluation.
- h. Gaining an unfair advantage in an academic evaluation by receiving specific information about a test, exam, or other assignment.

PLAGIARISM

Plagiarism can be defined as *representing orally or in writing, in any academic assignment or exercise, the words, ideas, or works of another as one's own without customary and proper acknowledgment of the source.*

Examples may include:

- a. Submitting material or work for evaluation, in whole or in part, which has been prepared by another individual(s) or commercial service.
- b. Directly quoting from a source without the customary or proper citation.
- c. Paraphrasing or summarizing another's work without acknowledging the source.
- d. Downloading material from Web sites without appropriate documentation.

FACILITATING ACADEMIC DISHONESTY

Helping or attempting to help another person commit an act of academic dishonesty is also a violation of academic integrity. Examples include:

- a. Providing assistance to another during an exam or other assignment in a manner not authorized by the instructor.
- b. Acting as a substitute for another in any exam or any other type of academic evaluation.
- c. Providing specific information about a recently given test, exam or other assignment to another student who thereby gains an unfair advantage in an academic evaluation.

- d. Permitting one's academic work to be represented as the work of another.
- e. Preparing for sale, barter, or loan to another such items as unauthorized papers, notes or abstracts of lectures and readings.

ABUSE OF ACADEMIC MATERIALS

Destroying or making inaccessible academic resource materials constitutes abuse of academic materials.

Examples of such actions include destroying, hiding, or otherwise making unavailable for common use library, computer, or other academic reference materials; and destroying, hiding, or otherwise making unavailable another's notes, experiments, computer programs, or other academic work.

STEALING

Stealing is defined as *taking, attempting to take, or withholding the property of another thereby permanently or temporarily depriving the owner of its use or possession.*

Examples of stealing include unauthorized removal of library materials, examinations, computer programs, or any other academic materials, including obtaining advance access to an examination through collusion with a University employee or otherwise; and taking another's academic work, such as papers, computer programs, laboratory experiments, or research results.

LYING

Lying is *making any oral or written statement that the individual knows to be untrue.*

Examples of lying include making a false statement to any instructor or other University employee in an attempt to gain advantage or exception; falsifying evidence or testifying falsely, such as in a Student Discipline and Grievance Committee hearing; inventing or counterfeiting data, research results, research procedures, internship or practicum experiences or other information; and citing a false source for referenced material/data.

ACADEMIC INTEGRITY PLEDGE

In order to address cheating and plagiarism, the SOP has developed an "academic integrity pledge" that has been used by many faculty to reinforce the importance of academic integrity. This pledge will be used for individual work assigned for classes, clinics,

internships, and all other types of instruction offered at the School of Pharmacy.

Individual work is defined as academic effort that was completed independently, without giving or receiving assistance from another. Collaborative work is defined as academic effort that may be completed in collaboration with others as directed by the instructor. All work is considered to be individual work unless the instructor specifies otherwise. For all individual work, instructors may require students to sign the following pledge:

"On my honor, I have neither given nor received aid on this assignment."

Student's signature: _____

Date: _____

Thus, students will state that the work that was submitted is their own and will be held accountable if evidence appears that is contrary to this statement. Students are reminded that neither the presence nor the absence of a signed pledge statement will allow students to violate established codes of conduct as described above.

PROCEDURES FOR ADDRESSING VIOLATIONS OF HONOR CODE

OVERVIEW

The following procedures were established by the students and faculty of the School of Pharmacy to address violations of the Student Honor Code and other complaints against Doctor of Pharmacy ("PharmD") students.

REPORTING

Every student has a moral duty to report every instance in which the student has knowledge that conduct has taken place, which violates this policy or its spirit to the faculty member responsible for instruction, or to the SGA president, the SGA advisor, or the associate deans of student affairs or academic affairs. Informal or formal grievance proceedings will commence in accordance with the policy contained herein.

Any member of the School of Pharmacy community, including a student, a group of students, a staff member, or a faculty member ("grievant") may bring a grievance against a student or a group of students ("respondent") under this policy for any academic or nonacademic action or inaction that is an alleged violation of the Honor Code, or is otherwise unethical, illegal or causes injury or damage.

Grievances may include, but are not limited to: violations of academic integrity; acts of discrimination based on race, color, religion, age, ancestry or national origin, gender, sexual orientation, physical or mental disability, marital status, or veteran status; lewd, obscene, or disruptive behavior on University premises or at University-supervised activities; sexual harassment; threatening or abusive communication to members of the University community; inappropriate or illegal use of alcohol, drugs and controlled substances or other violations of the substance abuse policies; violations of the acceptable use policy; intentionally initiating any false report or threat of fire, explosion or other emergency; violations of University or School policies; and violations of Baltimore City, state, or federal law.

The grievant should have firsthand knowledge or actual documentation supporting the alleged violation.

Grievances against faculty and grievances against students enrolled in programs of the UMB Graduate School are handled under separate policies and procedures. If the situation involves criminal or civil action against the grievant by the accused, the grievant may seek outside legal counsel and pursue the case in the local or state legal system.

INFORMAL GRIEVANCE

Grievances against PharmD students may be addressed through informal or formal channels. While most grievances are brought directly into the formal grievance process, the grievant may choose to resolve a minor grievance informally. The informal process is typically facilitated by faculty members, the director of educational services and outreach, or the associate deans for student affairs or academic affairs, and eventually leads to a resolution of issues acceptable to all parties involved.

A brief summary of the accusation and resolution is recorded by the ranking staff or faculty member, and included in the file of the respondent student.

FORMAL GRIEVANCE

Formal grievances are monitored by the associate dean for academic affairs. The dean or any of the associate deans can enforce an immediate temporary suspension in situations involving criminal activity, potential injury to members of the School's community, or other actions that demand an immediate action. The dean or associate dean may delay committee action or final decision pending the outcome of the criminal investigation. In cases of felony charges directly involving the School, suspension of the respondent pending outcome of the criminal matter may be a condition of delaying the grievance process. The Student Discipline and Grievance Committee will review these emergency situations in a timely manner and will conduct formal hearings to determine long-term course of action. Specific details of the situation will remain confidential until the formal grievance process has concluded.

PRELIMINARY EVALUATION

A grievance must be submitted in writing to the SGA president, the SGA advisor, or the associate dean of academic affairs ("associate dean"). These three constitute the Preliminary Evaluation Panel ("the panel"). Generally within 15 days of receipt of a written grievance, the panel will review the facts presented and will determine by majority vote if the matter should be forwarded to the entire Student Discipline and Grievance Committee ("the committee") for a formal hearing.

To preserve the timeliness of the process, in the event a member of the panel is unavailable or must recuse himself/herself due to a conflict of interest or bias, the remaining panel members will immediately select someone from the committee to serve as an alternate panel member.

The criteria for determining if a matter should not be forwarded to the committee include, but are not limited to:

1. whether the grievance is not subject to this policy based on the identity of the grievant, the identity of the accused, or the subject of the grievance;
2. whether an attempt at resolution of the grievance should first be made under informal resolution procedures; or
3. whether there is insufficient evidence to hear the grievance.

If a majority of the panel believes that a formal hearing should not be held, the associate dean or a designee will notify the grievant in writing of the panel's reasoning and counsel the grievant on alternative resolutions. The grievant may appeal for reconsideration by the panel by submitting a written response within 15 days to the panel through the associate dean. The panel's decision upon reconsideration is final.

DISCIPLINE AND GRIEVANCE COMMITTEE

The School's Discipline and Grievance Committee ("committee") hears and attempts to resolve all formal grievances. The committee is composed of seven voting members: four students and three faculty members. Student members of the committee will include the Student Government Association (SGA) president, the second- and third-year class presidents, and the most senior student member of the Student Affairs Committee. Faculty members include the SGA faculty advisor and the third- and fourth-year class advisors. The SGA president chairs the committee. The associate dean serves as an ex-officio, non-voting member.

NONTRADITIONAL PHARMD STUDENTS

The Discipline and Grievance Committee for NTPD students shall be composed of seven voting members: four students and three faculty members. Student members of the committee will include the Student Government Association (SGA) president, the second- and third-year class presidents, and an NTPD student selected by the NTPD Pathway director. Faculty members include the SGA faculty advisor and the third- and fourth-year class advisors. The SGA president chairs the committee. The associate dean and the NTPD Pathway director serve as ex-officio, non-voting members.

FORMAL GRIEVANCE PROCEDURE

TIMING

If the panel determines that a formal hearing is in order, the associate dean will notify the student respondent in writing that a formal grievance has been filed, the deadline for submission of a written rebuttal and a proposed date for the formal hearing,

and advice and counsel should be sought from the respondent's academic advisor. Along with the notice, the respondent will be provided with a written copy of the grievance, copies of evidence submitted by the grievant, and this policy. The respondent will be given up to 15 days to provide a written response to the committee via the committee chair. The committee will hold a formal hearing generally within 15 days after the deadline for receipt of the respondent's written response. A grievance of such severity that it might affect the respondent's eligibility to graduate will be considered on very short notice with the respondent's consent. Otherwise, graduation will be deferred pending resolution of the matter.

ACCESS TO EVIDENCE

Prior to the hearing, the committee will provide the grievant and the respondent with access to each other's allegations and responses, and any supporting information provided to the committee for consideration, including names of witnesses who will be presented during the hearing. The associate dean will facilitate this exchange of information. Whenever feasible, all supporting evidence and witness lists will be made available the week before the scheduled hearing.

THE FORMAL HEARING

COMMITTEE PRESENCE

All members of the committee, or alternates, must be present at formal hearings. Members of the committee will receive notice of the identity of the grievant and the respondent, the general nature of the grievance, and the proposed date of the hearing. Any committee members who cannot attend the hearing or who must recuse themselves will notify the chair immediately. Committee members who believe a potential conflict or bias may arise have a duty to recuse themselves as early in the process as possible. The chair shall appoint replacements as follows: a student member of the committee unable to attend will be replaced by an elected officer in the SGA, and a faculty member of the committee unable to attend will be replaced by a faculty member, preferably a member of the Student Affairs Committee.

PROCESS

The formal hearing is an internal academic process; rules of evidence do not apply and legal counsel will not be permitted to be present to represent either the grievant or the respondent. The chair will select a member of the committee to keep the official record of the proceedings, if administrative support is not available. The grievance is presented to the committee by the grievant or by a representative of the dean's office, in the presence of the respondent. The presenter of the grievance may call witnesses to present relevant information. The witnesses supporting the grievant may be questioned by the respondent and committee members. The chair may exclude from consideration repetitive or irrelevant evidence. The chair may adjourn the hearing and continue the hearing at a later time or date if circumstances necessitate such action.

Some matters may involve witnesses who are not affiliated with the School or evidence that must be obtained from parties other than the School and its students and faculty. The School does not have the authority to subpoena witnesses or evidence. Grievants and respondents are generally responsible for obtaining evidence and the presence of witnesses at the hearing. The School will provide reasonable assistance to the grievants and respondents in identifying relevant records maintained by the School that may be made accessible to the parties, if deemed appropriate by the School. Written statements are acceptable in lieu of personal appearance. However, no grievance process shall be terminated or abandoned due to the inability of the School to compel the appearance of witnesses or presentation of evidence. A grievance will be decided on the basis of evidence presented. Lack of witnesses or evidence will not create presumptions that the testimony and evidence would be favorable to the grievant or the respondent.

The respondent has the right to refuse to appear before the committee and the right to remain silent during the hearing. Refusal to appear will not be taken as an admission of guilt. The respondent has the right to: 1) present a statement in the respondent's own behalf at the hearing; 2) present witnesses having relevant information pertaining to the grievance; and 3) present relevant evidence in the form of written or tangible materials. The witnesses supporting the respondent may be questioned by the grievant and committee members.

The hearings and all information associated with the hearings will not be open to the public and will be conducted in a manner that preserves confidentiality to the most reasonable extent possible. All witnesses will be excluded from the hearing room until they are called to testify. All witnesses will be asked to affirm that any information they are presenting, including any written materials, is accurate and complete to the best of their knowledge and belief.

RESOLUTION

Upon completion of the hearing, the committee will meet in closed session to determine whether the grievance has been proven by the preponderance of the evidence; that is, whether on the basis of the evidence, it is more likely than not that the respondent has committed a violation of the conduct prescribed herein. The chair will remind the committee that it is to hear the matter, and to deliberate free from bias that may interfere with fair consideration of the case in question. The method of voting shall be by secret ballot. All questions before the committee will be decided by a simple majority vote. The committee will vote to find whether the respondent is responsible for the alleged violations. There is no grievant's right of appeal if the committee finds the respondent has not committed a conduct violation. A record of the case will be kept in the committee's files, as well as in the file of the respondent. If a respondent is found responsible for one or more conduct violations, the committee will decide on a course of action.

COURSE OF ACTION

Following a vote that the respondent is responsible for one or more conduct violations, the committee will take one of the following courses of action depending on the severity of the violation.

- a. **A letter of censure** stating that the respondent acted with impropriety. This is the least severe course of action and is meant to serve as a warning to the student for a lack of judgment or questionable behavior.
- b. **Disciplinary probation** for one or two semesters. Placing the respondent on probation will serve as a stern warning that repeat violations within the probation period may result in more serious disciplinary sanctions. A student may not participate in School- or University-sponsored extracurricular activities or serve as an officer in any School or University organization

while on disciplinary probation. At the end of the disciplinary probation period, the student will be placed in good disciplinary standing. This policy does not apply to academic status.

- c. **Suspension** for one or two semesters. Suspending the respondent is a serious sanction that is intended to allow the student time away from the University to reflect on and learn from his/her actions. The student may apply to the dean for reinstatement at the end of the suspension period.
- d. **Dismissal** from the School. Dismissal is the most severe course of action and may be applied in cases of repeat or severe violations.

In addition to the actions stated above, the committee may place other requirements on the respondent that relate to the case (i.e., to make restitution or repairs when property is damaged, to produce additional assignments, to seek counseling for behavioral issues). The respondent will also be informed of the right to appeal the committee's action to the dean.

The respondent and grievant will be informed in writing of the committee's action, and the respondent will be sent a letter describing the disciplinary action taken and any additional requirements. Such letters, along with the official record of the hearing, will be entered into the respondent's file and are retained in the committee's file until the student has left the School.

Generally within seven days after reaching a decision that the respondent is not responsible for conduct violations, or reaching a decision on the Course of Action applicable to the respondent who has committed conduct violations, the committee must submit a written report to the dean summarizing the matter, the hearing, the committee's decision, and the Course of Action, if any.

APPEAL TO THE DEAN

A respondent may appeal any action of the committee to the dean within 15 days of respondent's receipt of the decision. The appeal must be made in writing and must be filed in the dean's office. The appeal must be based on one or more of the following criteria:

- a. production of new evidence or relevant facts not produced in the hearing
- b. a claim of inadequate consideration of specific evidence
- c. a claim that a rule or regulation of the University or School applied in the case is not applicable
- d. a claim of denial of due process
- e. a claim that the Course of Action is unduly severe

If no appeal is submitted, then the committee's action is final. If the action is appealed, the dean will review the case and may affirm the committee's Course of Action, modify the committee's Course of Action, or remand all or part of the matter to the committee for further consideration. The dean may not overturn the committee's decision that a respondent is or is not responsible for the alleged violations. The dean will make a decision generally within 15 days after receiving the appeal or as soon as is reasonably possible. If the committee's decision is affirmed by the dean, the dean's decision is final.

ADMINISTRATIVE REPORTS

Upon conclusion of the matter, reports will be presented by the associate dean to the Faculty Assembly and by the SGA president to the SGA at the next scheduled meetings of those bodies, describing the characteristics and outcomes of the case in a manner that preserves student confidentiality rights under federal law.

OPTIONS FOR STUDENTS AND FACULTY REGARDING STUDENT GRIEVANCES

Students and faculty who have witnessed an action by a student that violates the School's or University's code of conduct, have a variety of options to pursue. Grievances may include, but are not limited to acts of discrimination based on race, age, gender, ethnicity, religion, sexual orientation, marital status, physical or mental handicap; violations of academic integrity; violations of University or School policies; lewd, obscene, or disruptive behavior on University premises or at University-supervised activities; sexual harassment; threatening or abusive communication to members of the University community; intentionally initiating any false report or threat of fire, explosion, or other emergency; violations of Baltimore City, state, or federal law.

Possible actions that may be taken include the following:

1. Consulting with the director of student services regarding informal resolution of problems.
2. Filing a formal grievance in writing to the SGA president, the SGA advisor, or the associate dean of student affairs.
3. Asking another party (student, faculty member, or administrator) to file the grievance on your behalf if you feel that you do not want to file the grievance but feel compelled to act in this situation.
4. Speaking at the Discipline and Grievance Committee Hearing, or if you do not want to appear, writing a statement to be read at the hearing.
5. Seeking outside legal counsel and pursuing the case in the local or state legal system if you feel that the situation involves criminal or civil action against you by the accused.

OTHER SCHOOL POLICY STATEMENTS

The School has policy statements relating to other matters on the Web site: www.pharmacy.umaryland.edu/studentaffairs/policies.htm.



Students Lisa Clayville, Judy Kwon, Tam Dang, and Deanna Tadena enjoy an SGA Student Leadership Retreat.



Students recite the Pledge of Professionalism at the White Coat Ceremony, which marks the entry of first-year PharmD students into professional education.

UNIVERSITY OF MARYLAND POLICY EXCERPTS

No provision of this publication shall be construed as a contract between any applicant or student and the University of Maryland. The University reserves the right to change any admission or advancement requirement at any time. The University further reserves the right to ask a student to withdraw at any time when it is considered to be in the best interest of University. Admission and curriculum requirements are subject to change without prior notice.

The University publishes the full text of the following policies and additional policies and procedures in the Student Answer Book. Students who do not receive the Student Answer Book each fall should call the Office of Student Services at 410-706-7117 (Voice/TTD). The Student Answer Book is online at www.umaryland.edu/student/sab. Additional University policies are online at www.umaryland.edu/policies.

ELIGIBILITY TO REGISTER

A student may register at the University when the following conditions are met:

1. the student is accepted to the University,
2. the student has received approval from the unit academic administrator, and
3. the student has demonstrated academic and financial eligibility.

FACULTY, STUDENT, AND INSTITUTIONAL RIGHTS AND RESPONSIBILITIES FOR ACADEMIC INTEGRITY

PREAMBLE

The academic enterprise is characterized by reasoned discussion between student and teacher, a mutual respect for the learning and teaching process, and intellectual honesty in the pursuit of new knowledge. By tradition, students and teachers have certain rights and responsibilities which they bring to the academic community. While the following statements do not imply a contract between the teacher or the institution and the student, they are nevertheless conventions which should be central to the learning and teaching process.

I. Faculty Rights and Responsibilities

- A. Faculty members shall share with students and administrators the responsibility for academic integrity.
- B. Faculty members shall enjoy freedom in the classroom to discuss subject matter reasonably related to the course. In turn, they have the responsibility to encourage free and honest inquiry and expression on the part of students.
- C. Faculty members, consistent with the principles of academic freedom, have the responsibility to present courses that are consistent with their descriptions in the catalog of the institution. In addition, faculty members have the obligation to make students aware of the expectations in the course, the evaluation procedures, and the grading policy.
- D. Faculty members are obligated to evaluate students fairly, equitably, and in a manner appropriate to the course and its objectives. Grades must be assigned without prejudice or bias.
- E. Faculty members shall make all reasonable efforts to prevent the occurrence of academic dishonesty through appropriate design and administration of assignments and examinations, careful safeguarding of course materials and examinations, and regular reassessment of evaluation procedures.
- F. When instances of academic dishonesty are suspected, faculty members shall have the responsibility to see that appropriate action is taken in accordance with institutional regulations.

II. Student Rights and Responsibilities

- A. Students share with faculty members and administrators the responsibility for academic integrity.
- B. Students have the right of free and honest inquiry and expression in their courses. In addition, students have the right to know the requirements of their courses and to know the manner in which they will be evaluated and graded.
- C. Students have the obligation to complete the requirements of their courses in the time and manner prescribed and to submit to evaluation of their work.
- D. Students have the right to be evaluated fairly, equitably, and in a timely manner appropriate to the course and its objectives.

- E. Students shall not submit as their own work any work which has been prepared by others. Outside assistance in the preparation of this work, such as librarian assistance, tutorial assistance, typing assistance or such special assistance as may be specified or approved by the appropriate faculty members, is allowed.
- F. Students shall make all reasonable efforts to prevent the occurrence of academic dishonesty. They shall by their own example encourage academic integrity and shall themselves refrain from acts of cheating and plagiarism or other acts of academic dishonesty.
- G. When instances of academic dishonesty are suspected, students shall have the right and responsibility to bring this to the attention of the faculty or other appropriate authority.

III. Institutional Responsibilities

- A. Constituent institutions of the University System of Maryland shall take appropriate measures to foster academic integrity in the classroom.
- B. Each institution shall take steps to define acts of academic dishonesty, to ensure procedures for due process for students accused or suspected of acts of academic dishonesty, and to impose appropriate sanctions on students found to be guilty of acts of academic dishonesty.
- C. Students expelled or suspended for reasons of academic dishonesty by any institution in the University System of Maryland shall not be admissible to any other USM institution if expelled, or during any period of suspension. Approved Nov. 30, 1989, by the Board of Regents.

SCHEDULING OF ACADEMIC ASSIGNMENTS ON DATES OF RELIGIOUS OBSERVANCE

It is the policy of the University of Maryland to excuse the absence(s) of students that result from the observance of religious holidays. Students shall be given the opportunity, whenever feasible, to make up, within a reasonable time, any academic assignments that are missed due to individual participation in religious observances. Opportunities to make up missed academic assignments shall be timely and shall not interfere with the regular academic assignments of the student. Each school/academic unit shall adopt procedures to ensure implementation of this policy.

CONFIDENTIALITY AND DISCLOSURE OF STUDENT RECORDS

It is the policy of the University of Maryland to adhere to the Family Educational Rights and Privacy Act (Buckley Amendment). As such, it is the policy of the University

1. to permit students to inspect their education records,
2. to limit disclosure to others of personally identifiable information from education records without students' prior written consent, and
3. to provide students the opportunity to seek correction of their education records where appropriate.

Each school shall develop policies to ensure that this policy is implemented.

SERVICE TO THOSE WITH INFECTIOUS DISEASES

It is the policy of the University of Maryland to provide education and training to students for the purpose of providing care and service to all persons. The institution will employ appropriate precautions to protect providers in a manner meeting the patients' or clients' requirements, yet protecting the interest of students and faculty participating in the provision of such care or service.

No student will be permitted to refuse to provide care or service to any assigned person in the absence of special circumstances placing the student at increased risk for an infectious disease. Any student who refuses to treat or serve an assigned person without prior consent of the school involved will be subject to penalties under appropriate academic procedures, such penalties to include suspension or dismissal.

UNIVERSITY OF MARYLAND POSITION ON ACTS OF VIOLENCE AND EXTREMISM WHICH ARE RACIALLY, ETHNICALLY, RELIGIOUSLY, OR POLITICALLY MOTIVATED

The Board of Regents strongly condemns criminal acts of destruction or violence against a person or the property of others. Individuals committing such acts at any campus or facility of the University will be subject to swift campus judicial and personnel

action, including possible suspension, expulsion, or termination, as well as possible state criminal proceedings.

STUDENT RESIDENCY CLASSIFICATION FOR ADMISSION, TUITION, AND CHARGE-DIFFERENTIAL PURPOSES

I. Policy

It is the policy of the University System of Maryland Board of Regents to recognize the categories of in-state and out-of-state students for purposes of admission, tuition, and charge differentials at those constituent institutions where such differentiation has been established. The student is responsible for providing the information necessary to establish eligibility for in-state resident status.

Students who are financially independent or financially dependent, as defined herein, shall have their residency classification determined on the basis of permanent residency which for purposes of this policy shall be determined by the criteria set forth in I.A. through E. below. A student will be assigned in-state status for admission, tuition, and charge-differential purposes only if the student, or in the case of a financially dependent student, the student's parent, guardian, or spouse, fulfills all of the following.

- A. For at least 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the petition applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must:
- own and continuously occupy or rent and continuously occupy living quarters in Maryland. There must exist a genuine deed or lease in the individual's name reflecting payments or rents and terms typical of those in the community at the time executed. People not having such a lease may submit an affidavit reflecting payments or rents and terms as well as the name and address of the person to whom payments are made which may be considered as meeting this condition. As an alternative to ownership or rental of living quarters in Maryland, a student may share living quarters in Maryland which are owned or rented and occupied by a parent, legal guardian, or spouse;

- maintain within Maryland substantially all personal property;
 - pay Maryland income taxes on all earned taxable income, including all taxable income earned outside the state;
 - receive no public assistance from a state other than Maryland or from a city, county, or municipal agency other than one in Maryland; and
 - have a legal ability under federal and Maryland law to reside permanently in Maryland without interruption.
- B. For at least 11 consecutive months immediately prior to and including the last date available to register for courses in the semester for which the application applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must:
- register all owned motor vehicles in Maryland, and
 - obtain a valid driver's license issued by the state of Maryland, if licensed to drive in any other jurisdiction.
- C. Within the 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the application applies, the student, or if the student is financially dependent, the parent, guardian, or spouse must register to vote in Maryland, if registered in any other jurisdiction.
- D. A financially independent student classified as in-state loses that status at such time as the student no longer meets one or more of the criteria set forth in I.A. through C above. A financially dependent student classified as in-state loses that status at such time as the parent, guardian, or spouse on whom the status was based no longer meets one or more of those criteria.
- E. In addition, people in the following categories shall be accorded the benefits of in-state status for the period in which any of the following conditions apply:
- a full- or part-time (at least 50 percent) regular employee of the University System of Maryland
 - the spouse or dependent child of a full- or part-time (at least 50 percent) regular employee of the University System of Maryland

- a full-time active member of the Armed Forces of the United States whose home of residence is Maryland or one who resides or is stationed in Maryland, or the spouse, or a financially dependent child of such a person
 - for University of Maryland University College, a full-time active member of the Armed Forces of the United States on active duty, or the spouse of a member of the Armed Forces of the United States on active duty
 - a graduate assistant appointed through the University System of Maryland for the semester or session of the appointment. Except through prior arrangement, status is applicable only for enrollment at the institution awarding the assistantship
- F. Students not entitled to in-state status under the preceding paragraphs shall be assigned out-of-state status for admission, tuition, and charge-differential purposes.

II. Procedures

- A. An initial determination of in-state status will be made by the University at the time a student's application for admission is under consideration. The determination made at that time, and any determination made thereafter, shall prevail for each semester or session until the determination is successfully challenged in a timely manner.
- B. A change in residency status must be requested by submitting a University System of Maryland "Petition for Change in Residency Classification for Admission, Tuition and Charge Differential." A student applying for a change to in-state status must furnish all required documentation with the petition by the last published date to register for the forthcoming semester or session for which a residency classification is sought.
- C. The student shall notify the institution in writing within 15 days of any change of circumstances which may alter in-state status.
- D. In the event incomplete, false, or misleading information is presented, the institution may, at its discretion, revoke in-state status and take other disciplinary actions provided for by the institution's policy. If in-state status is gained due to false or misleading information, the University reserves the right to retroactively

assess all out-of-state charges for each semester or session affected.

- E. Each institution of the University System of Maryland shall develop and publish additional procedures to implement this policy. Procedures shall provide that on request the president or designee has the authority to waive any residency criterion as set forth in section I, if it is determined that application of the criterion creates an unjust result. These procedures shall be filed with the Office of the Chancellor.

III. Definitions

- A. Financially Dependent: For purposes of this policy, a financially dependent student is one who is claimed as a dependent for tax purposes, or who receives more than one-half of his or her support from a parent, legal guardian, or spouse during the 12-month period immediately prior to the last published date for registration for the semester or session. If a student receives more than one-half of his or her support in the aggregate from a parent, legal guardian, or spouse, the student shall be considered financially dependent on the person providing the greater amount of support. The dependent relationship must have formally existed by legally contracted marriage or court order recognized under the laws of the state of Maryland for at least 12 consecutive months immediately prior to and including the last date available to register for courses in the semester or session for which the petition applies.
- B. Financially Independent: A financially independent student is one who
- (a) declares himself or herself to be financially independent as defined herein,
 - (b) does not appear as a dependent on the federal or state income tax return of any other person,
 - (c) receives less than one-half of his or her support from any other person or people, and
 - (d) demonstrates that he or she provides through self-generated support one-half or more of his or her total expenses.
- C. Parent: A parent may be a natural parent, or if established by a court order recognized under the laws of the state of Maryland, an adoptive parent.

- D. **Guardian:** A guardian is a person so appointed by a court order recognized under the laws of the state of Maryland.
- E. **Spouse:** A spouse is a partner in a legally contracted marriage as recognized under the laws of the state of Maryland.
- F. **Self-generated:** Describes income which is derived solely from compensation for an individual's own efforts as evidenced, for example, by federal or state W-2 forms or IRS Form 1099, in which interest income is based upon finances created from one's own efforts. For the purposes of this policy, grants, stipends, awards, benefits, loans, and gifts (including federal and state aid, grants, and loans) may not be used as self-generated income.
- G. **Regular Employee:** A regular employee is a person employed by the University System of Maryland who is assigned to a state budget line. Examples of categories not considered regular employees are graduate assistants, contingent employees, if-and-when-needed, and temporaries.

Approved by the University System of Maryland Board of Regents, Aug. 28, 1990; amended Nov. 27, 2000.

STUDENT RIGHT-TO-KNOW AND CAMPUS SECURITY ACT

The Student Right-to-Know and Campus Security Act (Public Law 101 542), signed into federal law Nov. 8, 1990, requires that the University of Maryland make readily available to its students and prospective students the information listed below. Should you wish to obtain any of the following information, send your name, address, school, and program, and a listing of the items of interest to:

Office of Student Services
Attention: Student Right-to-Know Request
University of Maryland
621 W. Lombard St., Room 302
Baltimore, MD 21201

- Financial Aid
- Costs of Attending the University of Maryland
- Refund Policy
- Facilities and Services for Students with Disabilities
- Procedures for Review of School and Campus Accreditation
- Completion and Graduation Rates for Undergraduate Students
- Loan Deferral Under the Peace Corps and Domestic Volunteer Services Act
- Campus Safety and Security
- Campus Crime Statistics
- Student Sexual Orientation Nondiscrimination

STUDENT SEXUAL ORIENTATION NONDISCRIMINATION

I. Background

Effective July 11, 1997, the University System of Maryland Board of Regents specifically prohibited discrimination against students on the basis of sexual orientation in academic admissions, financial aid, educational services, housing, student programs and activities, and recruitment. The board reserved the right to enforce or comply with any federal or state law, regulation or guideline, including conditions for the receipt of federal funding. This University reiterates its commitment to the most fundamental principles of academic freedom, equality of opportunity, and human dignity by requiring that treatment of its students and applicants for admission be based on individual abilities and qualifications and be free from invidious discrimination.

II. Related Employment Policy

University students who are also University employees should be aware of the "Employee Sexual Orientation Nondiscrimination Policy and Procedures."

III. Definition

Sexual orientation is the identification, perception, or status of an individual as to homosexuality, heterosexuality, or bisexuality.

IV. Policy

Consistent with USM's policy, it is this University's policy that:

- within the University, the educational environment will be free of discrimination on the basis of sexual orientation, and
- University students are prohibited from discriminating on the basis of sexual orientation against fellow students, University personnel, and other people with whom the students interact during the course of their educational experiences both on- and off-campus. Students may be disciplined for violation of this policy.

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(term expires 6/30/2006)

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- Mona Tsoukleris, PharmD, BCPS
*Ambulatory Care and Asthma Management,
University of Maryland; Continuing Studies
Administrator; Associate Professor, Department
of Pediatrics, University of Maryland School of
Medicine; Associate Professor, Pharmacy Practice
and Science*
- Mimi Wasti, BS
Executive Administrative Assistant to the Dean

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- John Ness**, PharmD, Upper Chesapeake Medical
Center & Harford Memorial Hospital
- Melinda M. Neuhauser**, PharmD,
National Institutes of Health
- Diem Kieu H. Ngo**, PharmD,
Malcolm Grow Medical Center
- Sharon T. Nguyen**, PharmD, Caremark
- Akwasi Nkansah**, BSP, Rite Aid Pharmacy
- Flora C. Nudelman**, BSP, CVS Pharmacy
- Godwin Odunze**, MS, Signet Health Plan
- Claudia C. Okeke**, PhD, U.S. Pharmacopeia
- Christine A. Oliver**, PharmD,
Food and Drug Administration
- Helen Osborn**, BSP,
Montgomery General Hospital
- Michele Overtoom**, PharmD, Giant Pharmacy
- James A. Owen**, BSP, Happy Harry's Pharmacy
- Heather A. Owens**, PharmD,
NeighborCare Pharmacies, Inc.
- Larry Owens**, PharmD, York Hospital
- Mehrnaz Pajoumand**, PharmD,
University of Maryland Medical System
- Joseph Pariser**, BSP, Giant Pharmacy
- Richard D. Parker, Jr.**, BSP, Giant Pharmacy
- Daniel S. Pastorek**, BSP, Shoppers Pharmacy
- Kalpna Patel**, MS, Giant Pharmacy
- Sheila Patel**, PharmD,
NeighborCare Pharmacies, Inc.
- Virbala A. Patel**, BSP, Giant Pharmacy
- David W. Patterson**, BSP, Health Guard
- Robert Patti**, PharmD, York Hospital
- Emilie Paul**, PharmD,
NeighborCare Pharmacies, Inc.
- Carol Paulick**, MBA, St. Agnes Health Care
- James Pellenberg**, BSP, Wal-Mart Pharmacy
- Kathleen A. Perez**, PharmD,
CGP, VA Medical Center
- Janice V. Perry**, PharmD, VA Medical Center
- Maureen W. Perry**, BSP, Virginia Maryland Regional
College of Veterinary Medicine
- Lynn J. Peterson**, BSP, CVS Pharmacy
- Paul Pham**, PharmD,
Johns Hopkins University School of Medicine
- Mark Pilachowski**, BSP, Klein's Pharmacy
- Sanyi Pin**, BSP, Bon Secours Hospital
- Brian Pinto**, PharmD,
The Johns Hopkins Hospital and Health System
- Bonnie L. Pitt**, MAS, Frederick Memorial Hospital
- Theresa M. Plog**, PharmD,
Memorial Hospital at Easton
- David Posner**, BSP, Bradley Care Drug
- Keith Pozanek**, BSP,
Citizens Pharmacy Services, Inc.
- Frank Pucino, Jr.**, PharmD,
National Institutes of Health
- Florence Raimoni**, MPA, Kernan Hospital
- Jacob R. Raitt**, PhD, Vetcentric
- Ashok A. Ramkissoon**, BSP, MAMSI/
HomeCall Pharmaceutical Services, Inc.
- Blanca Ratzlaff**, PharmD, VA Medical Center
- Parveen A. Rawala**, BSP, Happy Harry's Pharmacy
- James P. Reuter**, PharmD,
University of Maryland Medical System
- Earl W. Rhoads**, BSP, The Medicine Shoppe
- Wendy L. Rice**, PharmD,
Pharmacare of Cumberland
- Stephen P. Riggan**, BSP, CVS Pharmacy
- Arthur Riley**, MS, EMA Pharmacy, Inc.
- Carol D. Ritchie**, BSP, Thomas B. Finan Center
- Kim Z. Robbins**, BSP, Happy Harry's Pharmacy
- Kevin W. Roberts**, PharmD, Walter Reed Army Medical Center

- Michael D. Roberts, MS,**
National Rehabilitation Hospital
- Luis F. Rosado, BSP, BJ's Pharmacy**
- Wendy M. Rosenthal, PharmD,**
MedOutcomes, Inc.
- Patricia A. Ross, PharmD,**
The Johns Hopkins Hospital and Health System
- Michelle A. Rudek, PhD, PharmD,**
Sidney Kimmel Comprehensive Cancer Center
- Carol Rudo, PharmD, VA Medical Center**
- David Russo, MBA, Russo's Pharmacy**
- James J. Rybacki, PharmD, The Clearwater Group**
- Beulah P. Sabundayo, PharmD,**
Johns Hopkins University School of Medicine
- Janine Sadek, PharmD, Velcentric**
- Constanta E. Samborschi, PhD,**
Upper Shore Community Mental Health Center
- Cyrus Samet, PharmD,**
North Arundel General Hospital
- Rebecca D. Saville, PharmD,**
Food and Drug Administration
- Angela M. Scagiola, BSP,**
Harford Memorial Hospital
- Joseph J. Scalese III, BSP, Weis Pharmacy**
- Randolph Schaap, BSP, Rite Aid Pharmacy**
- Howard R. Schiff, BSP,**
Maryland Pharmacists Association
- Angelica Schneider, BSP,**
NeighborCare Pharmacies, Inc.
- Kevin A. Schnupp, PharmD,**
Maryland General Hospital
- Brian L. Schumer, BSP, Tuxedo Pharmacy**
- Pritesh K. Shah, PharmD, MASCL,**
Bristol-Myers Squibb Company
- Rizwan A. Shah, MS, Kmart Pharmacy**
- Kelly Shanahan, BSP, Giant Pharmacy**
- Brent Sharf, BSP, Bon Secours Hospital**
- Edwin A. Sheikh, PharmD, Andrx Laboratories**
- Matthew G. Shimoda, PharmD, CVS Pharmacy**
- Sudha Shukla, PharmD, VA Medical Center**
- Ralph L. Shumake, MS, Blue Mountain Apothecary**
- Lawrence Siegel, PharmD, MAS,**
Carroll Hospital Center
- Cheryl Simmons-Gray, PharmD, Kaiser Permanente**
- Tomas A. Simpson, BSP, Eckerd Pharmacy**
- Melissa Skarbelis, BSP, Wal-Mart Pharmacy**
- Ralph A. Small, Jr., BSP, Rite Aid Pharmacy**
- Billy R. Smith, MA, Monarch Pharmaceuticals, Inc.**
- Jennifer S. Smith, BSP, Acme Pharmacy**
- John Smith, BSP, Giant Pharmacy**
- Gary Sobotka, BSP, CVS Pharmacy**
- Fredrick P. Soetje, BSP, VA Medical Center**
- Dominic A. Solimando, Jr., MA,**
Walter Reed Army Medical Center
- Saburi O. Sonekan, BSP, Shoppers Pharmacy**
- Anh T. Sorof, PharmD,**
AstraZeneca Pharmaceuticals, LP
- Suzanne L. Spurr, PharmD, Kmart Pharmacy**
- Nora Stelter, PharmD,**
National Association of Chain Drug Stores
- Carol Stevenson, PharmD,**
NeighborCare Pharmacies, Inc.
- Jerry C. Stewart, BSP,**
Western Maryland Health System
- Howard C. Stoops, BSP, Cardinal Healthcare**
- Gary R. Stout, BSP, Safeway Pharmacy**
- Mark N. Strong, PharmD, Warm Springs**
Health & Wellness Center Indian Health
- Kimberly A. Struble, PharmD,**
Food and Drug Administration
- Vaiyapuri Subramaniam, PharmD,**
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- Susan L. Summers, BSP, CVS Pharmacy**
- Audrea Szabature, PharmD,**
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- William Tabak, BSP, Rite Aid Pharmacy**
- Richard Tarr, BSP, Giant Pharmacy**
- Lawrence Taylor, BSP, CVS Pharmacy**
- Christopher E. Thomas, PharmD,**
VA Medical Center
- Colby A. Thomas, PharmD, Sinai Hospital**
- Jennifer Thomas, PharmD, St. Agnes HealthCare**
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Nathan Thompson, MBA,
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Belinda A. Todjo, PharmD, Kaiser Permanente

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Lisa Townsend, PharmD, Hill's Drug Store

Dat T. Tran, BSP, Super Fresh Pharmacy

Penelope Trikeriotis, BSP, Giant Pharmacy

Kathleen Truelove, BSP,
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Marshall G. Tsakiris, BSP, Giant Pharmacy

Sara C. Turk, PharmD, Good Samaritan Hospital

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Terrill Washington, PharmD, VA Medical Center

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University of Maryland Medical System

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Calvert Memorial Hospital

Sandra S. Werking, PharmD, Mercy Medical Center

Samuel R. Wetherill, BSP, Happy Harry's Pharmacy

Josephine Whitford, PharmD, Kaiser Permanente

Thomas Wieland, BSP, Safeway Pharmacy

Stephen Wierner, BSP, Mt. Vernon Pharmacy

Michelle Willey, PharmD,
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Thomas Williams, PharmD, Wellspan Pharmacy

Rene L. Williamson, PharmD, Kaiser Permanente

Sharon D. Wilson, PharmD,
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Thomas Wilson, PharmD, Cape Apothecary

Dante R. Winter, BSP, Harford Memorial Hospital

Bay Mao B. Wu, PharmD, Kaiser Permanente

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Mia Wyatt, BSP, Twin Knolls Pharmacy

Ellen H. Yankellow, PharmD,
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Martin Yankellow, BSP, Weis Pharmacy

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MAMS1/HomeCall Pharmaceutical Services, Inc.

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Robert Zepp, BSP,
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CLINICAL INSTRUCTORS

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Robin Garner Smith, PharmD, Care Apothecary

John R. Gleespen, PharmD, Manchester Pharmacy

Patrina Hviid, PharmD, Target Pharmacy

Mandy C. Kwong, PharmD, CVS Pharmacy

William A. Ranker, PharmD, Safeway Pharmacy

Arash Raoufinia, PharmD, Global Pharmacokinetics
and Biopharmaceutics

Aime P. Service, PharmD, Sam's Club Pharmacy

PROGRAM COURSE DESCRIPTIONS

PHARMD COURSE DESCRIPTIONS

DIDACTIC REQUIRED COURSES

PHAR 510—Biochemistry (3)

A course of study which builds on the principles of cell biology and genetics with a systematic consideration of the chemical components and requirements of living systems from the molecular to the cellular level. These fundamentals of biochemical structure, function, and energetics provide a platform for comprehension of pharmaceutical biotechnology, and for understanding determinants of disease, the pathobiochemistry of organ systems, mechanisms of drug action and adverse reactions, and novel drug delivery systems.

PHAR 513—Drug Chemistry (2)

A study of the principles of organic chemistry that comprise basic elements of pharmaceutical science. The emphasis is on the relationship between molecular structure and chemical, physical, and biophysical properties of systems that arise from molecular interactions. The course provides a platform for comprehension of pharmaceutical concerns, such as the stability of drugs and drug products, the conformation of bioactive proteins, the basis for drug-receptor interactions, the structure of biological membranes, and major drug classes.

PHAR 514—Human Biology I (3)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology, and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.

PHAR 516—Pharmacy Practice and Education (2)

This prefatory course introduces the new Doctor of Pharmacy student to the science and profession of pharmacy. The evolution and implications of pharmaceutical care and the philosophical basis for the pharmacy curriculum are discussed. Students are introduced to skills necessary for success during the four-year curriculum through the opportunity to critically evaluate problems, discuss ethical dilem-

mas, develop and apply computer and literature-retrieval skills, and practice verbal and written communication skills. The importance of independent and cooperative learning activities is emphasized.

PHAR 517—Study Design and Analysis (2)

This course is an overview of the study designs and analyses used in medical research. Students will be introduced to the vocabulary of medical research and develop an understanding of the “how and why” of clinical study design, analysis, and the interpretation of study data. This knowledge is critical to be able to evaluate, interpret, and apply medical research to pharmaceutical care of the individual patient and the health of the community (public health).

PHAR 520—Molecular Biology (3)

This course is an integrated cell and molecular biology course. It is designed to thoroughly introduce the student to the mechanisms of DNA replication, recombination, repair, transcription, protein synthesis, and gene regulation and signal transduction. The course focuses on the relationship of these processes to current pharmaceutical interventions and those of the future. At the conclusion of this course, the student will also be able to describe, in detail, the mechanisms of DNA metabolism, protein synthesis, gene regulation, and signal transduction. The student will also be able to describe and indicate the basis for current diagnostic tests that incorporate modern cell and molecular biology techniques.

PHAR 522—Context of Health Care (3)

Students actively develop a contemporary definition of health care and critically examine the health care system with special emphasis on relevant legislation, traditional and nontraditional providers of health care, the organization and financing of health care delivery, and the dynamics of pharmaceutical care within the system. The social, legal, and professional implications of informatics and computer proliferation in our society are discussed with special emphasis on pharmacy practice.

PHAR 523—Ethics in Pharmacy Practice (1)

Introduction to the principles of ethical thinking. The philosophy of ethics and role of formal codes of professional conduct are discussed in the context of resolving ethical issues in pharmacy practice.

PHAR 524—Human Biology II (3)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regula-

tion of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology, and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.

PHAR 525—Immunology (2)

The natural and acquired protective mechanisms of the immune system are discussed with topics ranging from the structure, function, and specificity of antibodies; B-lymphocyte and T-lymphocyte functions; initiation and control of immune responses; histocompatibility; and immune-mediated disease. The course is designed to provide the student with sufficient knowledge of humoral and cellular immunity to understand the role of the immune system in disease, the production and use of vaccines and related biologicals, and the rapidly growing areas of transfusion, transplant, and tumor immunology.

PHAR 526—Physical Chemistry (2)

A study of selected principles of physical chemistry that comprise basic elements of pharmaceutical science. The emphasis is placed on the relationship between molecular structure and the physical and biophysical properties of systems that arise from molecular interactions. The goal of the course is to apply the principles of physical chemistry to the practice of pharmacy.

PHAR 530—Microbiology/Antibiotics I (2)

A study of the major classes of pathogenic bacteria, bacterial infectious diseases and antibacterial agents. This course surveys pertinent features of bacterial structure and virulence factors, host response and disease manifestations and antibacterial drug design, mechanisms, pharmacokinetics, and toxicity profile. This course will provide the framework for consideration of the therapeutic principles involved in treating bacterial diseases.

PHAR 531—Pharmaceutical Chemistry (2)

A presentation of the basic chemical principles underlying the activity, absorption, metabolism, excretion, physico-chemical properties, and design of drug molecules, culminating in a discussion of drug classes.

PHAR 532—Patient-Centered Pharmacy Practice and Management I (2)

This course provides pharmacy students an opportunity to learn important pharmacy practice and patient management skills that facilitate the development of a patient-centered pharmacy. The students learn practice management concepts that involve the development, implementation, and management of contemporary pharmacy services including patient assessment skills. Patient assessment principals and skills will be taught including the essential clinical skills of history taking and physical examination.

Management principles are provided to construct a practical framework for the operational management of a business. Elements addressed in this course include regulatory, economic, environmental variables that affect pharmacy practice and workflow analysis, accounting, purchasing and inventory control, quality assurance, summarizing and interpreting of financial data for service and merchandising entities, and third-party reimbursement issues. The course also examines the current practical developments related to human resources management through integration of information on organizational behavior, psychology, economics, and law. Prerequisites: PHAR 514 and PHAR 524 Human Biology I and II, PHAR 516 Pharmacy Practice and Education, PHPC 510 and PHPC 520 Introduction to Professional Practice I and II, PHAR 522 Context of Health Care, and PHAR 523 Ethics in Pharmacy Practice.

PHAR 533—Medicinal Chemistry I (1)

A comprehensive study of the chemistry of drug products. The course outline will follow the pharmacological classification of drug molecules, and will include discussion of chemical properties (physical and organic), stability, solubility, mechanisms of action where appropriate, and structure-activity relationships. Where possible, quantitative computer-designed studies of drug development will be mentioned.

PHAR 534—Human Biology III (3)

A consideration of the human body as an integrated, functioning organism with emphasis on how organs work individually and in harmony during the regulation of complex body functions necessary to establish and maintain homeostasis, and mechanisms underlying disordered organ functions and homeostasis. The anatomy, histology, and physiology of the human body is organized by organ systems to include the integumentary, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.

PHAR 535—Pharmaceutics (3)

The application of fundamental principles and basic science knowledge to the multidimensional problems of the formulation, development, testing, production, distribution, and administration of safe, effective, stable, and reliable drug delivery systems. These systems, ranging in sophistication from tablets and capsules to biodegradable implants, are discussed using a problem-based approach that focuses on the critical determinants for traditional and less-traditional routes of drug administration.

PHAR 536—Pharmacology I (3)

A systematic consideration of the molecular, cellular, and organismic mechanisms of drug action, organized by major drug classes. This course of study provides knowledge of the mechanisms of drug action underlying their use in the treatment of specific and general disease processes.

PHAR 537—Principles of Drug Action (2)

A study of the chemical and biological concepts which apply to the characterization, evaluation, and comparison of all drugs. Topics such as dose-response and receptor theory, receptor transduction mechanisms, pharmacologic selectivity, pharmacogenetic drug tolerance and dependence, drug allergy, drug resistance and chemical mutagenesis, carcinogenesis, and teratogenesis are discussed at the molecular and cellular level. The physical, biological, and chemical principles underlying drug absorption, distribution, biotransformation, and excretion are discussed from the molecular to the organ level.

PHAR 540—Microbiology/Antibiotics II (2)

A study of the major classes of pathogenic fungi and viruses, the diseases that they cause and antifungal and antiviral agents. This course surveys pertinent features of fungal and viral structure, virulence factors, life-cycle, disease manifestations and antifungal/antiviral drug design, mechanisms, pharmacokinetics, and toxicity profile. This course will provide the framework for consideration of the therapeutic principles involved in treating fungal and viral diseases.

PHAR 541—Biopharmaceutics and Pharmacokinetics (3)

This course provides the student with a basic understanding of biopharmaceutics and pharmacokinetics that can be applied to drug product development and drug therapy. Biopharmaceutics involves the study of the effects of dosage formulation on drug absorption

and distribution. Pharmacokinetics is the study of "what the body does to the drug," encompassing absorption, distribution, metabolism, and excretion. The mathematical relationship between drug concentrations and time will be examined as well as the rational design of drug regimens based on patient-specific factors, pharmacokinetic parameters, and pharmacodynamics. Pharmacodynamics represents the study of the relationship between drug concentrations and the resultant pharmacologic action.

PHAR 542—Clinical Chemistry (1)

The aim of this course is to introduce the student to the medical record. Didactic presentations will emphasize the scientific basis for a variety of laboratory tests while the illustrative case discussions will emphasize the clinical importance and interpretation of these tests in a patient care environment. Students will be exposed to real data, emphasizing the understanding and application of the basic and clinical sciences for the purpose of interpreting pertinent physical findings and clinical laboratory data.

PHAR 543—Medicinal Chemistry II (2)

A comprehensive study of the chemistry of drug products. The course outline will follow the pharmacological classification of drug molecules, and will include discussion of chemical properties (physical and organic), stability, solubility, mechanisms of action where appropriate, and structure-activity relationships. Where possible, quantitative computer-designed studies of drug development will be mentioned.

PHAR 544—Patient-Centered Pharmacy Practice and Management II (2)

This course provides pharmacy students an opportunity to learn important pharmacy practice and patient management skills that facilitate the development of a patient-centered pharmacy. The students learn practice management concepts that involve the development, implementation, and management of contemporary pharmacy services including patient assessment skills. Patient assessment principals and skills will be taught including the essential clinical skills of history taking and physical examination.

Management principles are provided to construct a practical framework for the operational management of a business. Elements addressed in this course include regulatory, economic, and environmental variables that affect pharmacy practice and workflow analysis, accounting, purchasing and inventory control, quality assurance, summarizing, and interpreting of financial data for service and

merchandising entities, and third-party reimbursement issues. The course also examines the current practical developments related to human resources management through integration of information on organizational behavior, psychology, economics, and law. Prerequisites: PHAR 532 Patient-Centered Pharmacy Practice and Management I, PHAR 514 and PHAR 524 Human Biology I and II, PHAR 516 Pharmacy Practice and Education, PHPC 510 and PHPC 520 Introduction to Professional Practice I and II, PHAR 522 Context of Health Care, and PHAR 523 Ethics in Pharmacy Practice.

PHAR 546—Pharmacology II (3)

A systematic consideration of the molecular, cellular, and organismic mechanisms of drug action, organized by major drug classes. This course of study provides knowledge of the mechanisms of drug action underlying their use in the treatment of specific and general disease processes.

PHAR 552—Principles of Human Nutrition (1)

This required course builds on materials in earlier coursework including Fundamentals, Basic Science, and Pharmaceutical Science. The course focuses on the preparation of pharmacists to deliver pharmaceutical care services related to patients' nutritional needs. The course prepares the student to understand principles of nutrition in relation to contemporary public health issues and to treatment of diseases and physiologic processes. The materials taught in this course are applied and further developed in subsequent modules in the Integrated Science and Therapeutics course sequence and in Longitudinal Pharmaceutical Care II.

PHAR 553—Population-Based Medical Information Analysis (2)

This course is designed to enhance a student's skills in the areas of information collection, retrieval, analysis, and interpretation. A variety of topics surrounding the aspects of drug information practice will be presented, including the role of informational services in health care. Students will enhance both their written and verbal communication skills as they not only are asked to retrieve pertinent clinical information, but also then to interpret, document, and integrate this information into the development of clinical practice guidelines and subsequent outcome measures.

PHAR 554—Integrated Science and Therapeutics I (4)

PHAR 555—Integrated Science and Therapeutics II (4)

PHAR 564—Integrated Science and Therapeutics III (4)

PHAR 565—Integrated Science and Therapeutics IV (4)

Basic and clinical science faculty interact with students during a variety of didactic and laboratory experiences as students learn to design, implement, and monitor pharmaceutical care plans for specific patients with specific diseases. Methods for the choice of drug product, definitions of the specific goals of therapy, including the means to assess whether these goals are being achieved, and active intervention steps at the patient, prescriber, health care system, and population levels to ensure successful outcomes of drug therapy are developed. The courses are organized according to the major physiological systems of the human body, and the disease states commonly associated with them and encountered and observed by the pharmacy practitioner in a variety of community and institutional practice settings. A goal of these courses is to prepare students to be able to better integrate new scientific knowledge into the successful pharmaceutical care of patients with the goal of reducing the health care costs to patients and society. The knowledge and behaviors acquired during these courses prepare the student for the community and institutional pharmaceutical care rotations of the experiential learning program of the curriculum.

PHAR 580—Pharmacy Law (2)

An examination of the legal and regulatory issues pertaining to drugs and devices and the practice of pharmacy. Students learn the various laws and regulations which would govern their usual daily activities in a variety of practice sites. This course seeks to prepare students for the Maryland State Board law exam.

PHAR 581—Senior Colloquium (1)

Students deliver oral presentations to share some aspect of their educational experience, practice aspirations, or career goals with their student peers and the faculty. This forum fosters a critical examination of each student's formal education in the context of the practice of pharmaceutical care.

EXPERIENTIAL LEARNING REQUIRED COURSES

PHPC 510—Introduction to Professional Practice I (1) PHPC 520—Introduction to Professional Practice II (1)

These courses introduce students to the professional practice of pharmacy through practice laboratory exercises, a focus workshop, and experiential learning assignments. Career options are explored in traditional community and institutional practices and a differentiated practice site. These courses also facilitate the initial integration of information and skills learned at the School with pharmacy practice at experiential learning sites, and set the expectations for professionalism throughout experiential learning courses. (Register for PHPC 520 spring semester, first year)

PHPC 532—Longitudinal Care I (1)

This is the first of two courses, where students deliver pharmaceutical care to patients over time. In this course, students have the opportunity to interact with individuals, collect a pharmaceutical care database, develop a problem list and make appropriate non-pharmacological recommendations. Students will develop a pharmacist-individual relationship as the first step in the delivery of pharmaceutical care. In addition to appreciating the humanistic aspects involved in providing care to individuals, students will acquire basic skills necessary to deliver pharmaceutical care. This course provides opportunity for students to integrate and apply knowledge previously acquired in PHAR 516 Pharmacy Practice and Education, PHAR 522 Context of Health Care, and PHAR 523 Ethics in Pharmacy Practice. This course is completed from September to May of the second year. (Register spring semester, second year)

PHPC 562—Longitudinal Care II (1)

Longitudinal Care II is completed from September to May during the third professional year, concurrent with the Integrated Science and Therapeutics (ISAT) sequence. Students learn how to identify and assess pharmaceutical care problems and to develop and implement pharmaceutical care plans in collaboration with their preceptors and other health care professionals. Skills already developed in Longitudinal Care I are reinforced and further refined in Longitudinal Care II. Concepts and knowledge acquired in the third year Integrated Sciences and Therapeutics course are applied and reinforced. When applicable,

students practice previously learned basic physical assessment skills as part of their data collection. (Register spring semester, third year)

PHPC 570—Safe Medication Order Processing in Community Pharmacy (3) PHPC 571—Safe Medication Order Processing in Institutional Pharmacy (3)

PHPC 570 Community and PHPC 571 Institutional are professional practice experiences which target the inter-related elements of safe medication order processing, drug distribution, patient interaction, supervision of pharmacy technicians, use of technology, and practice administration/personnel management. In both the community and institutional setting, under the supervision of clinical faculty, students will be challenged to develop skill, competence, and efficiency in processing medication orders for distribution to and safe use by patients. This course can be completed the summer after the second year, the winter of the third year, or the summer after the third year. If taken during the summer after the second year or summer after the third year, register for appropriate fall semester. If taken during the winter of the third year, register for spring semester.

PHPC 572—Community Pharmaceutical Care (3) PHPC 573—Institutional Pharmaceutical Care (3) PHPC 574—General Pharmaceutical Care (3)

Training in this series of professional practice rotations is designed for the student to obtain extensive experience in the delivery of pharmaceutical care in a variety of clinical settings. The student will gain skill through daily one-to-one interactions with patients, caregivers, and other health care providers. Each student is required to complete four full-time, four-week pharmaceutical care rotations (total 544 hours). Of these four rotations, at least one must be in an acute care hospital setting and one in a community pharmacy setting. Although each site will differ in terms of the patient population, disease acuity, scope of practice, resources, and availability of patient-specific data, the student will take responsibility for drug therapy outcomes. The student will: 1) collect and record patient-specific data, 2) identify, list, and assess drug-related problems, 3) develop and record pharmaceutical care plans, 4) educate patients and health care professionals regarding the appropriate use of drugs, and 5) measure and document patient outcomes. (Students may take these courses after successfully completing the third year. Register fall and spring semesters, fourth year.)

PHPC 576—Ambulatory Clinic (1)

PHPC 576 training is a professional practice rotation intended to expose the student to the delivery of pharmaceutical care in an ambulatory clinic setting. The student will gain skills through one-on-one interactions with patients, caregivers, and other health care providers. During this course, students will complete a minimum of 48 hours' experience via clinics scheduled half a day per week for 12 sessions. Whenever possible, all 12 clinic days will take place at the same site and with the same preceptor. Through this experience, students will be expected to solidify the knowledge, skills, and attitudes necessary to provide pharmaceutical care in an ambulatory care setting. Prerequisites: PHPC 570 Safe Medication Order Processing in Community Pharmacy and PHPC 571 Safe Medication Order Processing in Institutional Pharmacy and successful completion of the Integrated Science and Therapeutics course series. (Register spring semester, fourth year)

PHPC 577—Informational Services (2)

This course must be taken concurrently with the Pharmaceutical Care rotations. The goal of the Informational Services Experiential Unit is to construct an experience in providing drug information within the context of the delivery of pharmaceutical care in institutional, ambulatory, and specialty services. At the completion of this course, fourth-year students will be able to utilize their drug information skills in the establishment of accurate pharmaceutical care plans, in the performance of drug use evaluations, and in the selection process of formulary management. Students should be able to provide valuable drug information as part of their delivery of pharmaceutical care. Students will address drug information issues that occur during these experiences and will learn how to conduct timely and accurate literature searches, and evaluate sources of drug information. Prerequisite: Successful completion of PHAR 553 Population-Based Medical Information Analysis. (Register spring semester, fourth year)

DIDACTIC ELECTIVE COURSES

The elective didactic (PHMY) courses currently offered by the School of Pharmacy are described below. In general, higher course numbers indicate courses with important prerequisite requirements, and are designed for later years of the curriculum. Prerequisites for most electives include consent of the instructor and the student's advisor. Some elec-

tives are offered in either the fall or spring semesters, and some are offered both semesters. Refer to the class schedule when making course selections.

PHMY 501—Oncology Pharmacotherapy (2)

This course allows students to engage in advanced discussions of oncology therapeutic topics and increase their knowledge about the etiology, clinical presentation, and management of various solid and hematological malignancies. Students will become more effective in identifying, preventing, and managing the complications related to cancer and cancer therapy. Course content expands and builds upon oncology topics covered in ISAT and includes additional topics such as pediatric solid tumors, bone marrow transplantation, and oncologic emergencies. Therapeutic topics will be reinforced with the discussion of actual patient cases. Students will participate in journal clubs and mock patient counseling sessions.

PHMY 502—Medication Safety in Health Care (2)

This course is designed to provide students in the health care professions (medicine, nursing, and pharmacy) with a basic introduction to medication safety. The course will introduce the student to important issues and current concepts in medication safety. Medical error will be distinguished from unintended drug effects such as adverse events and side effects. The student will also learn key strategies related to identifying, reporting, managing, and preventing medication errors, as well as current legislative and professional issues.

PHMY 503—"I Can Cope": Pharmacy Educators in Pain Management (1)

This course prepares pharmacy students to serve as facilitators in the "I Can Cope" series developed by the American Cancer Society. Specifically, students will be taught how to facilitate a session on the module titled "Relieving Cancer Pain." Pharmacy facilitators will lead a class concentrating on the health challenges to wellness and quality of life imposed by cancer pain. An overview of pain, medical treatments to control pain, and nonmedical strategies are presented to help empower participants and assist them to begin building a repertoire of self-care techniques.

PHMY 504—Issues In Health-System Pharmacy (1)

This course will familiarize students with issues faced by health-system pharmacy. The student will learn the background and substance of the issues and approaches used in dealing with them. Areas covered will include medication use safety, automation/drug

distribution, financial issues/outsourcing, communications, organization of corporate entities, leadership/management, and quality of services. Prerequisites: Phase I Experiential Learning Rotations.

PHMY 510—Advanced Educational Opportunities (1)

This elective program provides students interested in graduate school or research careers with knowledge and information about various advanced educational opportunities in the curriculum. Aspects of careers which require advanced study are described by professionals in those career areas and by students currently enrolled in them. The course offers diverse perspectives on goals, training, functions, settings, and opportunities in research in pharmaceutical sciences and pharmacy practice.

PHMY 511—Diabetes Disease State Management (1)

This course will review the pathophysiologic changes associated with diabetes mellitus (Types I and II, impaired glucose tolerance, and gestational diabetes), nonpharmacologic management (nutrition and exercise), pharmacologic management, complications of diabetes mellitus, principles of education (children, adolescents, adults, and geriatrics), continuous care (skin and foot care, OTC product selection), blood and urine monitoring, special population considerations (children, adolescents, geriatrics, visually impaired patients), psychosocial aspects of diabetes (dealing with diagnosis, developing support strategies, and adherence to regimens), and how to set up a diabetes-focused practice.

Prerequisite: Fourth-year status.

PHMY 512—Case Based Management of Infectious Diseases I (1)

PHMY 513—Case Based Management of Infectious Diseases II (2)

These courses provide third- (PHMY 512) and fourth-year (PHMY 513) students and students in the Non-traditional Pathway with an opportunity to critically examine the clinical decisions made in the management of patients with infectious diseases. During the first course, students will review the therapeutic decisions made in the care of a patient encountered during an experiential course and review the literature relevant to those decisions. During the second course, students will present a case discussion, including a thorough review of the standard of care and the literature support for the decisions made.

Prerequisites: Third-year status or PHNT 545 and 546 Therapeutics I and II.

PHMY 514—Teaching Preparation and Skills (1)

The course is a basic introduction to instructional activities in general and teaching at the University of Maryland School of Pharmacy in particular. The first two days consist of a series of presentations on teaching-related topics. The instructors will develop a short interactive lecture on diabetes management to demonstrate each aspect of the teaching and presentation development process. There will be frequent in-class activities requiring student interaction. During these, students will begin to develop their own topic for presentation on the last day of class. Teaching Preparation and Skills is an unusual modular course originally developed for nontraditional PharmD students. It was intended to improve their ability to make in-class presentations. However, since the ability to create and deliver a lecture or seminar is fundamental to many students and faculty members within the School, it is now frequently attended by graduate students and new faculty members. In addition to teaching participants how to make presentations in general, it focuses on using presentation technology available in the School of Pharmacy.

PHMY 516—Geriatric Imperative (2)

The Geriatric Imperative minimester is a five-day interdisciplinary course open to all University of Maryland students during the first week in January. The course presents a wide range of information on the health and well-being of older adults through clinical, research, and policy presentations. Course content will be conveyed through lectures, panel discussions, team and case presentations, role play, videotapes, and site visits. Students will be required to write an in-depth paper on a subject pertaining to geriatrics/gerontology within two months of completing the didactic portion of the course.

PHMY 517—Geriatric Pharmacotherapy (2)

This course provides advanced discussion of the geriatric diseases and different presentations of disease and responses to therapy. A case-based approach expands on previous geriatric coursework and allows students to apply material to different patient-care settings. Journal club and drug information questions are utilized to illustrate concepts.

Prerequisite: Third-year status.

PHMY 518—Drug Abuse Education (1-3)

Practice and training in the dissemination of drug information, especially drug abuse information to the public, are linked to the activities of the Student Committee on Drug Abuse Education (SCODAE). Students complete a 10-hour training session, observe community education programs presented by SCODAE, present several programs, and prepare a written report on a timely topic in the area of chemical dependence.

PHMY 519—Controlled Drug Delivery (1)

This course aims at optimizing drug therapy by delivering bioactive agents at specific sites or at specific rates to patients.

PHMY 520—Organizational Behavior (3)

This course covers the effects of human behavior on organizational effectiveness. Attention is given to quality, teamwork, attitude toward work, satisfaction and commitment, building and exercising organizational power, the role of leadership, sustaining motivation, participatory decision-making, and the process for change, development, and continuous improvement.

PHMY 522—Business Plan Development (2)

An elective course for students interested in ownership or management of their own pharmacy practice, emphasizing the practical problems associated with establishing a new business or expanding an existing enterprise. Location and market analysis, target marketing, revenue and expense projections, and estimation of capital requirements are among the topics covered.

PHMY 524—Marketing (3)

Marketing introduces methodologies for identifying changes in the organization's marketplace and adapting to them. The course uses the market-orientation concept, emphasizing customer needs, total integration of the firm, and the profit potential to examine the marketing process, and in doing so, will use pharmacy-based examples. Prerequisite: PHAR 544 Patient-Centered Pharmacy Practice and Management II.

PHMY 525—Comprehensive Pediatric Care (2)

Comprehensive pediatric care is a 2-credit course offered in the spring semester for third- and fourth-year students in the entry-level Doctor of Pharmacy program. This elective course is designed to prepare students to optimize medicine use in pediatric patients in the ambulatory or institutional setting. The course will cover cognitive and physiological development, psychosocial factors affecting medicine

use, pharmacist role, regulatory issues, and pediatric pharmacotherapy for various disease states.

PHMY 526—High Impact Presentations (2)

This elective course is designed to prepare students to be well-prepared and competent presenters and to clearly and succinctly convey their information through oral and visual presentations. Students will be required to describe the process used to prepare an effective presentation, select and develop the appropriate audio visual aids to enhance a presentation, assess the quality of a presentation and the quality of the skills used by the presenter, and plan and deliver a presentation that meets the needs of a specific audience, using appropriate audio-visual enhancements, and techniques to maximize learning and retention of educational content.

PHMY 529—Special Group Studies (1-5)

An omnibus course permitting experimentation with new or different subject matter and/or instructional approaches.

PHMY 537—Clinical Aspects of Drug Dependence (2)

This course familiarizes students with the clinical aspects of chemical dependence. Special emphasis is placed on the pharmacology of commonly abused psychoactive substances and the role of pharmacological supports in the treatment of addiction.

PHMY 539—Special Projects (1-3)

(Repeatable up to 12 credits) Independent investigations consisting of library or laboratory research, seminars, or other assignments appropriate to the problem investigated.

PHMY 541—Introduction to the Poison Center (1)

This course provides students the opportunity to observe and be involved in a clinically oriented pharmacy practice setting early in their education. Students learn about the Poison Center's operation and resources and the potential for pharmacist participation in this area of patient care. The course consists of discussion sessions, activities in the Maryland Poison Center, role playing, and laboratory sessions focusing on toxicology resources and communication skills. Students present cases on a home-managed and a hospital-managed overdose.

PHMY 545—Educational Theory and Practice (2)

To achieve optimal health outcomes, pharmacists must educate patients and health care professionals regarding the appropriate use of drugs. However, few pharmacists have had formal training in instructional design or methods. This course will consist of small group discussion sessions, journaling, and a self-directed learning project. Readings will be assigned prior to each small group discussion session and will focus on educational learning theory, instruction design, and instruction methods. Discussions will be highly interactive, and there will be no formal lecturing. Each discussion session will be two hours in duration. Participants will keep a "learning journal" with their personal reflections following each discussion session. The self-directed learning project must culminate in a learning event of at least one hour in duration. Prerequisites: Completion of PHPC 532 Longitudinal Pharmaceutical Care I and permission of the coursemaster.

PHMY 548—Women's Health (3)

Using a case-based and highly interactive instructional techniques, students will explore a broad range of health issues that women face throughout the life cycle as well as further develop their skills to evaluate patient-specific data, make appropriate therapeutic decisions, and design drug therapy monitoring plans. Specific issues/disorders to be discussed will include contraception, infertility, vaginal disorders, menstrual disorders, gestational diabetes, eclampsia, menopause, and osteoporosis. Prerequisites: Completion of PHAR 554 and PHAR 555 ISAT I and II.

PHMY 551—Recent Advances in Pharmacology (1)

The objective of this course is to present advances in pharmacology and toxicology. Sessions emphasize experimental and clinical findings and their interpretation and significance in relation to basic and applied aspects of pharmacology and toxicology. Attention is also given to experimental design and methodology of the studies in question.

PHMY 552—Pharmacology and Aging (1)

This course presents advances in our understanding of variations in drug response in the aging population. The course is designed to give students an appreciation for the basic physiological and biomedical changes which normally occur with aging and how these changes relate to altered pharmacodynamic and pharmacokinetic responses following drug adminis-

tration. Basic and clinical pharmacologic studies are used to support the conclusions presented.

PHMY 553—Consumer Education Program for Older Adults (2)

This course trains students to educate the elderly about drugs and drug-taking. Students benefit from the didactic and applied aspects of the course, since they must first learn about the special needs of the elderly and then actually interact with the elderly both in large groups and one-on-one.

PHMY 556—Advanced Pharmacology I (2)**PHMY 557—Advanced Pharmacology II (2)**

This course expands and extends the pharmacology material learned in the required courses PHAR 536 and 546. The course format is the discussion of assigned topics and review of original papers in a two-hour, weekly session. These sessions include graduate students in the pharmaceutical sciences.

PHMY 561—Advanced Therapeutics Seminar (3)

An advanced course dealing with complex drug therapy decision-making, using case presentations and current literature. Requires active student participation in resolution of therapeutic controversies.

PHMY 562—Clinical Pharmacokinetics (2)

The course will extend the student's knowledge of clinical pharmacokinetics, develop the student's skills in providing pharmacokinetic drug monitoring during PharmD rotations, and prepare students for post-graduate work in clinical pharmacology research. Emphasis is placed on the application of these principles to clinical practice and clinical research.

PHMY 563—Pharmacotherapeutic Issues in the Critically Ill Patient (2)

This course is an elective seminar for students interested in critical care pharmacotherapy. Topics include a broad scope of disease states and drug issues frequently encountered in an ICU setting. Presentations will identify the pharmacologic aims and controversies in the management of a particular topic, while simultaneously underscoring the complexities of drug therapy in the critically ill patient, which may lead to untoward reactions or suboptimal care.

PHMY 574—Pharmacotherapeutics I (2)**PHMY 575—Pharmacotherapeutics II (2)**

Pharmacotherapeutics is a course in advanced therapeutic decision-making which parallels the therapeutic topics offered in the Integrated Science and Therapeutics modules during the third year of the curriculum. The course requires students to formu-

late therapeutic decisions based upon case materials and emphasize the process of decision-making in the presence of multiple patient and agent variables. As the number of cumulative therapeutic topics increases, the complexity of the decision-making increases. Students are expected to incorporate data from the primary literature as part of the therapeutic decision-making process.

PHMY 576—Advanced Topics in Pharmaceutics (2)

This course will allow students to become familiar with advanced topics in pharmaceutics. Different topics will be presented in the form of lectures, group discussions of original papers, and laboratories, and will include bile acid sequestrants, drug dissolution, production methods for inhalation aerosols, metered-dose inhaler formulation, tablet compaction, pellet drug delivery, critical formulation and manufacturing variables, oral drug absorption, and novel chemical approaches for targeted drug delivery. Prerequisites: PHAR 535 Pharmaceutics or concurrently enrolled in Pharmaceutics or consent of coursemaster.

PHMY 577—Pharmacoeconomics (3)

This course is designed to familiarize students with the economic structure, conduct, and performance of the pharmaceutical industry. The course includes such topics as prices and profit in the industry, productivity, costs, economies of scale, innovation, economic effects of regulation, and cost benefit and cost effectiveness analysis of pharmaceuticals. Prerequisite: One undergraduate course in economics or permission of instructor.

PHMY 581—Research Pathway Seminar (1)

The objective of this course is to provide an overview of pharmaceutical and other health- and life-science-oriented research by attending research seminars and participating in the discussion of those seminars.

PHMY 583—Management of Health Care Systems (3)

This course will familiarize students with the different practice settings in integrated health systems ranging from community pharmacies to managed care organizations and hospitals. Areas that will be covered include pharmacy benefits management, disease state management, information management, models of integrated health systems, management of the therapeutic process, negotiating and networking, and the response of pharmacy practice settings to the changes in these systems. Prerequisite:

PHAR 523 Ethics in Pharmacy Practice, PHAR 544 Patient-Centered Pharmacy Practice and Management II, PHPC 570 Safe Medication Order Processing in Community Pharmacy Rotation, and PHPC 571 Safe Medication Order Processing in Institutional Pharmacy Rotation.

PHMY 584—Patient Counseling (2)

Students will learn key information about the Top 200 prescribed drugs in the United States. The content will focus on information that needs to be communicated to patients concerning their therapy. This material will reinforce what students have learned in other courses. In addition, students will become familiar with new product-specific material that has not been addressed in the curriculum. Periodic quizzes will assess student knowledge. The Pharmacy Practice Laboratory will also be used to videotape students as they counsel simulated patients.

PHMY 585—Perspectives of Mental Health (2)

This course provides students with an understanding of the mental health system, discusses controversies that may face the practicing pharmacist, familiarizes students with tools and techniques for studying psychopharmacologic agents, and helps to define pharmacists' roles in providing mental health care.

PHMY 586—Journal Club I (2)

This elective course is abilities-based, structured in a journal club format, and parallels second-year courses. The elective provides a forum in which students can practice and enhance oral and written communication skills, literature retrieval, and evaluation activities, while learning new information relating to ongoing required coursework. Students select articles from the primary, basic, or clinical research literature and lead discussions of the articles. The discussions include study design, informational content, and how the articles relate to and enhance the topics of courses the students are concurrently taking or have taken. Prerequisite: Second-year status. (Course offered spring and fall semesters.)

PHMY 586—Journal Club II (2)

This elective course is abilities-based, structured in a journal club format, and parallels third-year courses. The elective provides a forum in which students can practice and enhance oral and written communication skills, literature retrieval, and evaluation activities, while learning new information relating to ongoing required coursework. Students select articles from the primary, basic, or clinical research liter-

ature and lead discussions of the articles. The discussions include study design, informational content, and how the articles relate to and enhance the topics of courses the students are concurrently taking or have taken. Prerequisite: Third-year status or fourth-year status with permission of the coursemaster. (Course offered spring and fall semesters.)

PHMY 587—Mammalian Anatomy and Histology (2)

This advanced-level elective course provides students a structured opportunity for a major dissection of two mammalian species. Students observe the location and structure of all organs of the body and their relation to each other. Working in teams at their own pace, students systematically dissect an adult, preserved cat, and a pregnant rat. Students also perform a directed study of prepared, selected histology slides of many tissues and organs. Prerequisite: PHAR 524 Human Biology II and/or consent of coursemaster. (Course offered spring and fall semesters. Students cannot take both PHMY 587 and PHMY 590.)

PHMY 590—Fetal Pig Dissection (1)

This elective course provides students the opportunity to dissect a mammalian species. Students observe the location and structure of all organs of the body and their relation to each other. Working in teams at their own pace, students systematically dissect a near-term fetal pig. Prerequisite: PHAR 514 Human Biology I and/or consent of coursemaster. Students cannot take both PHMY 587 and PHMY 590. (Course offered spring and fall semesters.)

PHMY 591—Principles and Practice of Modern Compounding (2)

Using a combination of lectures, problem-solving workshops, and skill-building laboratories, this course teaches the appropriate extemporaneous compounding of drug preparations in pharmacies. Prerequisite: PHAR 535 Pharmaceutics.

PHMY 592—Clinical Toxicology (2)

The clinical toxicology course will provide students with an overview of the clinical manifestations, assessment and treatment of poisonings with common drug, chemical, and biological agents. The format includes lectures by faculty members, case discussions led by students and a laboratory experience. Course evaluation includes the discussion sessions, the antidote laboratory and open book midterm and final exams. Prerequisite: Third-year status. Note: This course is highly recommended as preparation for PHEX 552 Poison Information Rotation.

PHMY 593—Care of the Terminally Ill (2)

This course prepares students to interact with terminally ill patients through increased understanding of the social and psychological aspects of death and dying as well as the palliative pharmacotherapeutic management of these patients. Prerequisite: Third-year status.

PHMY 595—Complementary and Alternative Medicine (2)

This course explores the principles behind the botanical information and folklore uses of herbal remedies and provides an overview of alternative medicine as it is currently emerging. Alternative medicine therapies are also discussed: their rationale, safety, validity, and current therapeutic use.

PHMY 596—Nonprescription Medicine (3)

This course is designed to thoroughly familiarize the student with OTC medications. Emphasis will be placed on the pharmacology of these drugs, potential disease states in which the drugs will be used, self-administration techniques, consideration in selecting a product, triage issues, and patient counseling. Prerequisite: Third-year status.

PHMY 597—Bereavement (1)

This course addresses the skills and knowledge needed to serve bereaved individuals: the theory of attachment, loss, and grief, as well as how to effectively interact with the bereaved.

PHMY 598—Effective Leadership and Advocacy (2)

This 2-credit elective is offered to provide leadership and political advocacy development for students, including the officers of student organizations. Students are expected to be active participants in at least one of the School's student organizations. Students will examine leadership as they explore current health care issues and gain direct experience in the political process and community action.

EXPERIENTIAL LEARNING ELECTIVE COURSES

The experiential learning elective (PHEX) courses at the School of Pharmacy are described below. In general, experiential electives can be taken for either 1, 2 or 3 semester hours of credit. Some experiential electives may require prerequisites. See www.pharmacy.umaryland.edu/clp/ for more information.

- PHEX 509—Practice Experience (1, 2, 3)
- PHEX 540—Contemporary Pharmacy Practice (2, 3)
- PHEX 541—Blood and Marrow Transplantation (2, 3)
- PHEX 543—Developmental Disabilities, Psychiatric Aspects of (2, 3)
- PHEX 544—Hematologic Malignancies (2, 3)
- PHEX 545—Compounding (2, 3)
- PHEX 551—Drug Information (2, 3)
- PHEX 552—Poison Information (2, 3)
- PHEX 559—Research Experience (1, 2, 3)
- PHEX 560—Adult Internal Medicine (2, 3)
- PHEX 561—Ambulatory Care Clinic (2, 3)
- PHEX 562—Clinical Pharmacokinetics (2, 3)
- PHEX 563—Administration/Organizational Management (2, 3)
- PHEX 564—Cardiology (2, 3)
- PHEX 565—Critical Care (2, 3)
- PHEX 570—Food and Drug Administration (2, 3)
- PHEX 572—Geriatric Pharmacotherapy (2, 3)
- PHEX 574—Infectious Disease (2, 3)
- PHEX 575—HIV/AIDS (2, 3)
- PHEX 576—Medical Oncology (2, 3)
- PHEX 578—Transplantation Pharmacotherapy (2, 3)
- PHEX 579—Investigational Drugs (2, 3)
- PHEX 581—Research Oncology Pharmacokinetics (2, 3)
- PHEX 582—Pediatrics (2, 3)
- PHEX 583—Radiopharmacy/Nuclear Pharmacy (2, 3)
- PHEX 584—Clinical Aspects of Chemical Dependence (2, 3)
- PHEX 587—Psychiatry (2, 3)
- PHEX 588—Pharmacy Benefits Management (2, 3)
- PHEX 589—Special Topics (1, 2, 3)
- PHEX 589—SPEC/Women's Health (2, 3)
- PHEX 590—Advanced Community Pharmaceutical Care (2, 3)
- PHEX 591—Palliative Care (2, 3)

NONTRADITIONAL PHARMD (NTPD) PATHWAY

The NTPD Pathway requires 30 credits, including 5 credits of electives. Students are required to complete all requirements for graduation by the conclusion of the spring semester 2006. Course numbers do not reflect prerequisite sequencing of courses.

- PHNT 500—General Principles of Pharmaceutical Care (3)
(Phased out fall 2002)
- PHNT 505—Prior Learning Assessment of Pharmacy Practice (2)
(Phased out spring 2003)
- PHNT 511—Practice Management (4)
(Phased out fall 2003)
- PHNT 512—Principles of Pharmaceutical Sciences (2)
(Phased out spring 2003)

PHNT 521—Longitudinal Care (1) (Offered through fall 2005)

This longitudinal experiential course focuses on assessing the health status of a cohort of patients in the student's own practice and participating in the management of pharmaceutical care needs of these patients during health transitions. It is expected that students commit a minimum of approximately 45 hours (e.g., an average of about three hours per week over a semester) to experiential activities in this course at their own practice site. Students are expected to apply skills from this course in subsequent pharmaceutical care experiential coursework.

- PHNT 531—Practice Management Planning (2)
(Phased out spring 2004)
- PHNT 532—Patient Assessment Skills (1)
(Phased out summer 2004)

PHNT 534—Clinic or Institutional Assignment (1) (Final offering spring 2006)

Activities in this spring course include supervised development of pharmaceutical care plans, triage decision-making, discharge/transition planning, and patient counseling. Students are assigned to a total of 15 three-hour, faculty-supervised pharmaceutical care sessions outside their own practice setting.

PHNT 536—Drug Information Experience (1)
(Offered through spring 2006)

Pharmacists will acquire and apply drug information skills in their own practice. Students will develop their own drug information library, access appropriate drug information databases, and utilize appropriate pharmaceutical and medical literature to prepare drug information reports. Assignments are made based upon the needs of the patients in the student's practice and the organizational needs of the practice site.

PHNT 545—Therapeutics I (3)
(Phased out fall 2004)**PHNT 546—Therapeutics II (3)**
(Phased out spring 2005)**PHNT 547—Medical Information Analysis (1)**
(Phased out spring 2003)**PHNT 570—Pharmaceutical Care Experience (3)**
(Final offering spring 2006)

This course is designed to help practicing pharmacists build the skills needed to deliver pharmaceutical care services to patients. Students develop and implement triage or discharge plans and pharmaceutical care plans for a cohort of patients (in addition to the patients accumulated during the longitudinal care experience) in their own practice. Patients selected for plan development and implementation must have at least two pharmaceutical care problems. Students communicate these plans to other health care professionals, monitor the response of patients to these plans, make any necessary modifications, and assess patients' health outcomes. Students are expected to commit a minimum of 180 hours (an average of about 12 hours per week over the semester) to activities related to this course. During this course, students will be accountable for application of pharmacotherapy topics acquired through the didactic pharmacotherapeutics courses. Students completing this course will demonstrate the Nontraditional PharmD Pathway's terminal performance objectives related to the implementation of pharmaceutical care services in their practice site.

**PHD/PHARMACEUTICAL
HEALTH SERVICES RESEARCH****REQUIRED COURSES****PHSR 610—Pharmacy, Drugs,
and the Health Care System (3)**

This course examines the principle components of the U.S. health care system, with special emphasis on their relationship to the provision of drugs and pharmacy services.

**PHSR 620—Introduction to
Health Behavior Theory (3)**

This course covers medical sociology, psychology, social psychology, and interpersonal communication theories and research as they address medicine use and health-related behaviors involving patients, pharmacists, physicians, nurses, and other health care professionals. Students are acquainted with select health behavior theories and learn about research issues specific to the field of behavioral science.

PHSR 650—Pharmaceutical Economics (3)

This course is designed to familiarize the student with the economic structure, conduct, and performance of the pharmaceutical industry. The course includes such topics as prices and profits in the industry, productivity, cost, economies of scale, innovation, economic effects of regulation, cost benefit and cost effectiveness of pharmaceuticals, and efficiency of drug delivery systems. Prerequisite: One undergraduate economics course or permission of the instructor.

PHSR 701—Research Methods I (3)

This course is designed to introduce the student to the concepts of scientific research in pharmacy practice and administrative science. Topics to be discussed include the scientific method and problem-solving processes, social science measurement, and several specific methods of research. Co-requisite: Introduction to Biostatistics.

PHSR 702—Research Methods II (3)

This course is the capstone methodology seminar for Pharmaceutical Health Services Research (PHSR) doctoral students. It is designed to give you the research tools to design studies of the impact of pharmaceutical (or other) interventions or policies in actual practice settings. Unlike clinical trials where subjects are randomized to treatment or placebo arms, health services researchers typically are forced

to use non-experimental designs with secondary data. The course will take you through the pitfalls in such designs and show you how to deal with them. Prerequisite: PHSR 701 Research Methods I or similar graduate-level introductory social science research methods course PLUS Introduction to Biostatistics (multivariate regression) or permission of the instructor.

PHSR 704—Pharmacoepidemiology (3)

An introduction to the field of pharmacoepidemiology, which uses quantitative research methods to examine questions of benefit or risk in regard to the use of marketed medications. The course is intended to offer useful techniques to medical and health researchers who wish to assess the utilization, effectiveness, and safety of marketed drug therapies. Prerequisites: Introduction to Biostatistics and Introduction to Epidemiology.

PHSR 709—Graduate Seminar (1)

This course is a weekly seminar involving graduate students, department faculty, and participants outside the department. Must be repeated for a total of 3 credits.

PREV 600—Principles of Epidemiology (3)

A comprehensive treatment of the concepts and methods of chronic disease epidemiology. Topics include the classification of statistical associations and the methods for distinguishing between causal and non-causal associations. Casecontrol, cohort, and experimental studies are considered in some detail. The course involves the presentation by students of epidemiological papers, including those linking lung cancer to cigarette smoking. Co-requisite/Prerequisite: PREV 620 Principles of Biostatistics or an Introduction to Biostatistics equivalent.

PREV 619—Computer-Aided Analysis of Research Data (2)

Provides the student with comprehensive experience in the application of epidemiological and biostatistical methods available in the Statistical Analysis System (SAS). Hands-on experience in weekly workshops is gained by conducting analyses of existing data designed to answer a research question. A third credit can be earned through a term project. Co-requisite/Prerequisite: PREV 620 Principles of Biostatistics, previously or concurrently, and consent of instructor.

PREV 620—Principles of Biostatistics (3)

This course is designed to develop an understanding of statistical principles and methods as applied to human health and disease. Topics include research design; descriptive statistics; probability; distribution models; binomial, Poisson and normal distributions; sampling theory; and statistical inference. Prerequisite: Knowledge of college algebra required. Calculus recommended.

PHSR 899—Dissertation

ELECTIVE COURSES

PHSR 670—Principles of Health Education, Health Promotion and Disease Prevention (3)

Health education is a scientific process designed to achieve voluntary behavioral change in an identified or target population to improve their health status. Health promotion utilizes health education, social marketing and other strategies to promote health and prevent disease. The PRECEDE/PROCEED Model is an analytical instrument used to explore health issues and identify and assess the associated behavioral and non-behavioral factors in order to design interventions with improved predictive validity. This course addresses health education at the level of the individual, the family, and the community at large. Because the relationship between practitioner and patient is often a major determinant of outcome, health promotion in the clinical setting is given emphasis.

PHSR 708—Special Problems (1-6)

This course involves students working with faculty members in numerous research projects or on a problem. Can be used to finish a cognate area with prior approval by curriculum committee. It can be undertaken for credit when initiated under the supervision of the student's research mentor or another faculty member. The student must register for PHSR 708. If the student opts to take that course, he or she should provide a one-page document which details the objective of the research and the deliverable expected from the project before the semester commences. This can be taken for a maximum of 6 credits per semester. Non-Dissertation Research Special Problems - used for all Cognate Areas.

PHSR 722—Product Safety and FDA Regulation (2-3)

The purpose of this course is to engage students in the techniques of pharmacoepidemiology through case studies and by working through an actual drug safety investigation. Drug safety will be addressed in the context of science and the law through readings, debates, and discussions with invited guests. Using the FDA's Adverse Event Reporting System database and the medical literature, students will work up the epidemiological characteristics of a drug safety signal. Based on the characteristics of the signal, the team will design a pharmacoepidemiological study to further evaluate the safety signal. Prerequisites: PREV 600 Principles of Epidemiology, PREV 620 Principles of Biostatistics, and PHSR 704 Pharmacoepidemiology or permission of instructor.

PREV 720—Statistical Methods (4)

Course provides instruction on the specific statistical techniques used in the analysis of epidemiological data. Topics include treatment of stratified and matched data, detection of interaction, conditional and unconditional logistic regression, survival analysis, and proportional hazards models. Prerequisites: PREV 600 Principles of Epidemiology, PREV 620 Principles of Biostatistics, and consent of instructor.

Food and Drug Law Seminar (3) UMB School of Law

This seminar considers the U.S. Food and Drug Administration as a case study of an administrative agency that must combine law and science to regulate activities affecting public health and safety. The class is designed both for students who expect to become involved in food and drug matters and for those who are interested in the interplay of law and science. Topics to be discussed may include: history of the U.S. Food and Drug Administration; food law, misbranding, and economic issues; nutritional policy and health claims; regulation of carcinogens, food additives, and color additives; drug regulation; drug approval process; breakthrough drugs and ethics of drug testing; medical device regulation; and regulation of biotechnology. Course requirements include a seminar paper, which may be written for certification. Students, with the consultation of their Curriculum Committee, will select courses from UMB and other University System of Maryland institutions/schools that will fulfill the students' requirements for their cognate area as well as any elective courses for which the student decides to register. Students may visit the appropriate university catalog or Web site for complete information regarding these courses.

PHD/PHARMACEUTICAL SCIENCES

PHAR 600—Principles of Drug Discovery (3 credits) and PHAR 601—Principles of Drug Development (3 credits)

Describes the interrelationship among disciplines of the pharmaceutical sciences, and establishes the basic theoretical background essential for identifying molecules that are targeted for the drug design and development process. Emphasizes ability development; content progresses, beginning with basic cell biology, defining molecular targets, traditional drug design and optimization of drug structure, continuing with principles of pharmacology, pharmaceuticals, biopharmaceutics, pharmacokinetics, and drug metabolism. Also covers integrative competency in the final module. The courses are taken during the first two semesters and are divided into seven integrated modules. These modules relate the various disciplines within the pharmaceutical sciences to the drug discovery, drug design, and development process.

PHAR 602—Biopharmaceutics and Pharmacokinetics (3)

Focuses on drug absorption, distribution, metabolism, and excretion coupled with dosage and the parameters of clearance, volume of distribution, and bioavailability. These processes determine the concentration of drug at the site of action in the body. Covers the quantitative relationship between dose and effect as a framework to interpret measurement of drug concentrations in biological fluids, and pharmacokinetic principles using mathematical processes and descriptive parameters that describe the time course of drugs in the systemic circulation and the relationship of drug concentrations to observed effect.

PHAR 608—Introduction to Laboratory Research (1)

Students become familiar with research conducted by departmental faculty members. Rotations through the laboratory of a faculty member help students in their selection of a doctoral dissertation project. The rotation includes library work and an opportunity for participation in the experimental aspects of research. Students must complete at least two laboratory rotations. Students meet with the chairs of all Research Focus Groups before selecting a rotation site.

PHAR 610—Pharmaceutical Formulation and Unit Processes (4)

Addresses the rational design and formulation of dosage forms, and the processes and equipment in their large-scale manufacture. Consideration is on how the interplay of formulation and process variables affects both the manufacturability of the dosage form and its performance as a drug delivery system.

PHAR 620—Modern Methods of Drug Delivery (4)

Focuses on the rationale for existing and future drug delivery systems. Students explore underlying physical, chemical, and biological basis for each system, and identify benefits and drawbacks. Examples of delivery systems include inhalation aerosols, transdermal patches, microspheres, implants, and tablets. Emphasis is on the biopharmaceutics, and transport properties and barriers associated with each method of delivery. The course also stresses written and oral presentation skills through student presentations and paper critique sessions.

PHAR 628—Bioanalytical and Pharmacological Methods (3)

Covers theory and applications of separation and analysis techniques used for low molecular weight compounds, such as most drugs, or for larger biopolymers, such as proteins and nucleic acids. Also covers the separation of chiral compounds, and assay requirements and techniques for the sensitive and accurate measurement of drugs and metabolites in biological matrices, with emphasis on pharmacokinetics and biopharmaceutical applications.

PHAR 638—Pharmacometrics and Experimental Design (3)

Covers the theoretical and practical application of statistics and experimental design to help students use tools in research problems. The class discusses and uses computer programs to analyze data representing actual experimental situations.

PHAR 639—Molecular Spectroscopy and Imaging (3)

Introduces students to spectrometric techniques for the elucidation of molecular structure and to the analysis of pharmaceutically important materials. The methodologies covered include ultraviolet visible, infrared, nuclear magnetic resonance, X-ray crystallography, mass spectrometry, and fluorescence spectroscopy. The class includes discussions of physical principles, instrumentation involved, exercises in the interpretation of spectrometric data, and examples of applications.

**PHAR 653 and 654
Advanced Pharmacology I and II (4, 4)**

Pharmacodynamics is the study of the biochemical and physiological effect of drugs on biological systems. The course covers mechanisms by which pharmacological agents interact with the living organism to provide the student with a rational basis for investigations in biomedical research. Topics include the pharmacodynamics of drugs influencing the central and peripheral nervous system, and the endocrine, renal, respiratory, and cardiovascular systems. Lectures supplement weekly conferences and discussion groups.

PHAR 702—Theoretical Aspects of Solid Dosage Forms (3)

A survey of the performance and processing of solid dosage forms. As most pharmaceuticals are prepared from powders, emphasis is on identifying, measuring, and controlling those properties that decide the processing characteristics of powdered materials.

PHAR 707—Drug Transport and Metabolism (4)

This course will provide basic knowledge about drug absorption at different sites in the human body (e.g. intestine, blood-brain barrier, kidney, liver) and the physicochemical and pharmaceutical factors, as well as pathophysiologic conditions, that influence drug penetration. This course will allow the students to understand the choice of a particular absorption route and dosage form. Furthermore, the interplay of drug metabolism and drug transport will be discussed.

PHAR 708—Comprehensive Exam Seminar (1)

As part of the advancement to PhD candidacy comprehensive exam, students make an oral presentation of their dissertation research proposal at the beginning of their third year.

PHAR 709—Departmental Seminars (1)

Attendance at departmental seminars is required. Guest speakers are brought in to give departmental seminars on recent developments in all aspects of pharmaceutical sciences. Students will have the opportunity to give one departmental seminar after they have completed their comprehensive exam and before their dissertation defense.

PHAR 729—Principles of Drug Action (3)

Advanced study of the principles of drug action, carcinogenesis, immunology, the molecular view of pharmacology, and theoretical principles and practical applications of molecular modeling. A computer laboratory is associated with molecular modeling aspect.

PHAR 747—Advanced Pharmacokinetics (3)

A detailed study of the principles of drug transport, distribution, biotransformation, binding and excretion, with emphasis on quantitative aspects and measurement of these processes. The course is designed to provide students with an advance understanding of the mathematical concepts, physiological concepts and system software to characterize pharmacokinetic processes. The prerequisite to the course is PHAR 602 Biopharmaceutics and Pharmacokinetics. The course focuses on providing a foundation in understanding various modeling approaches including Data Analysis techniques, model identifiability, development and validation. The use of weighting in pharmacokinetic/pharmacodynamic analysis will be presented, along with a hands-on use of current pharmacokinetic data analysis programs (i.e., ADAPT II, Winonlin, NONMEM). Physiological Based Pharmacokinetic modeling, Population Pharmacokinetic Analysis, Statistical Moment Theory and Pharmacokinetic/Pharmacodynamic Analysis of direct and indirect modeling. Students will learn the theoretical concepts that underlie the data analysis techniques used to describe pharmacokinetic and pharmacodynamic processes. Students will be provided with hands-on data analysis problems with many of the current pharmacokinetic and pharmacodynamic packages.

PHAR 751—Drug Design (3)

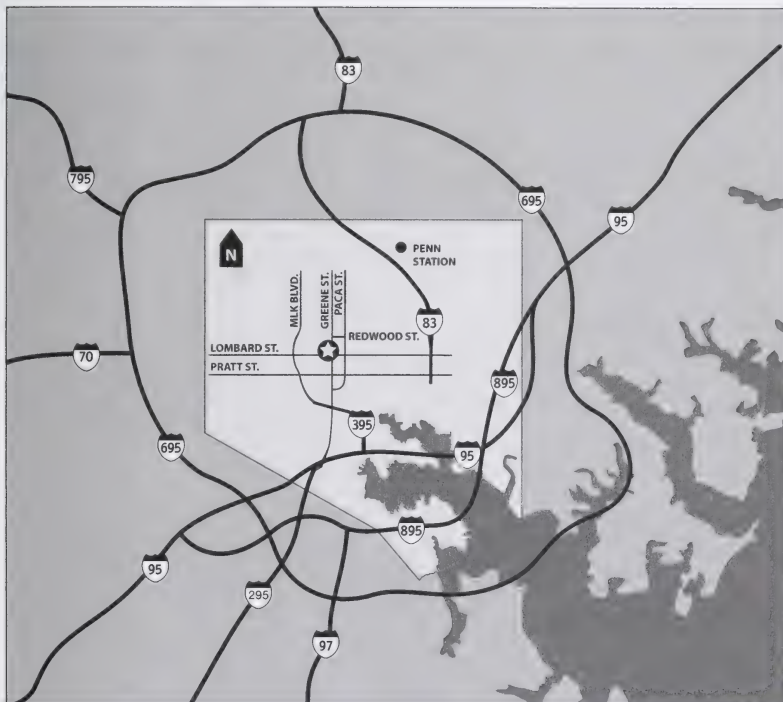
Applications of chemical and biological principles to the rational design of drugs. Topics include targets of biologically active molecules, approaches to studying ligand and target interactions, overview of drug discovery, agents acting on specific targets, combinatorial chemistry, computation chemistry, and structure-activity relationships.

PHAR 858—Special Topics (1-6)

Students examine an issue of pharmaceutical importance through readings, discussions, and limited investigations. The student and instructor decide the research problem and amount of credit before the start of the study.

PHAR 899—Doctoral Dissertation Research (1-3)

DIRECTIONS AND MAP



TO REACH THE SCHOOL OF PHARMACY

School of Pharmacy
 University of Maryland
 20 N. Pine St.
 Baltimore, MD 21201
 410-706-7650
 800-852-2988

DIRECTIONS

From I-95: Take 95 to exit Rte. 395 (downtown Baltimore) Martin Luther King Jr. Blvd. (MLK). Stay in the right lane after exiting onto MLK. At the fourth traffic light, turn right onto Baltimore Street. (The School is on the left at the corner of MLK and Baltimore Street.) Turn left at the 2nd traffic light onto Paca Street (get into right lane) and enter the Baltimore Grand Garage on your right. There is limited metered parking on the streets around the School.

CAMPUS MAP

UNIVERSITY OF MARYLAND CAMPUS BUILDINGS

100 N. Greene St.	14
111 S. Greene St.	54
405 W. Redwood St.	36
737 W. Lombard St.	47
Allied Health Bldg. 100 Penn St.	49
Athletic Center 10th Floor, Pratt St. Garage	59
Biomedical Research Facility 108 N. Greene St.	13
Bressler Research Bldg. 655 W. Baltimore St.	27
Community Outreach Police Station 700 W. Pratt St.	57
Davidge Hall 522 W. Lombard St.	43
Dental School Hayden-Harris Hall 666 W. Baltimore St.	18
Dental School (future site) 650 W. Baltimore St.	18a
Dr. Samuel D. Harris National Museum of Dentistry 31 S. Greene St.	41
East Hall 520 W. Lombard St.	44
Environmental Health and Safety Bldg. 714 W. Lombard St.	38
George Gray Hall 520 W. Lombard St. (rear)	42
Grand Offices 5 N. Paca	23
Hilda Katz Blaustein Research Center (SSW) 550 W. Baltimore St. (Floors 1 and 5)	21
Health Sciences Facility I 685 W. Baltimore St.	25
Health Sciences Facility II 700 W. Lombard St.	39
Health Sciences and Human Services Library (HS/HSL) 601 W. Lombard St.	53
Howard Hall 660 W. Redwood St.	26
Lombard/ 515 Bldg. 515 W. Lombard St.	55
Maryland Bar Center 520 W. Fayette St.	15
Medical School Teaching Facility (MSTF) 685 W. Baltimore St.	24

Nathan Patz Law Center/ Thurgood Marshall Law Library 500 W. Baltimore St.	22
Operations and Maintenance Offices 622 W. Fayette St.	12a
Parking and Commuter Services Office 622 W. Fayette St.	12
Pascault Row 651-665 W. Lexington St.	9
Pharmacy Hall 20 N. Pine St.	17
Pharmacy Learning Center 110 N. Pine St.	8
Pine St. Police Station 214 N. Pine St.	4
Saratoga Garage and Offices 220 N. Arch St.	2
School of Nursing 655 W. Lombard St.	51
School of Social Work Louis L. Kaplan Hall 525 W. Redwood St.	34
Student Center at Pine St. 222 N. Pine St.	1
UMB BioPark 800 W. Baltimore St.	65
UM Biotechnology Institute 721 W. Lombard St.	48
University Plaza	29
University Square Bldg. 11 S. Paca St.	30
University Suites at Fayette Square 500 W. Fayette St.	16
Westminster Hall 529 W. Fayette St.	20

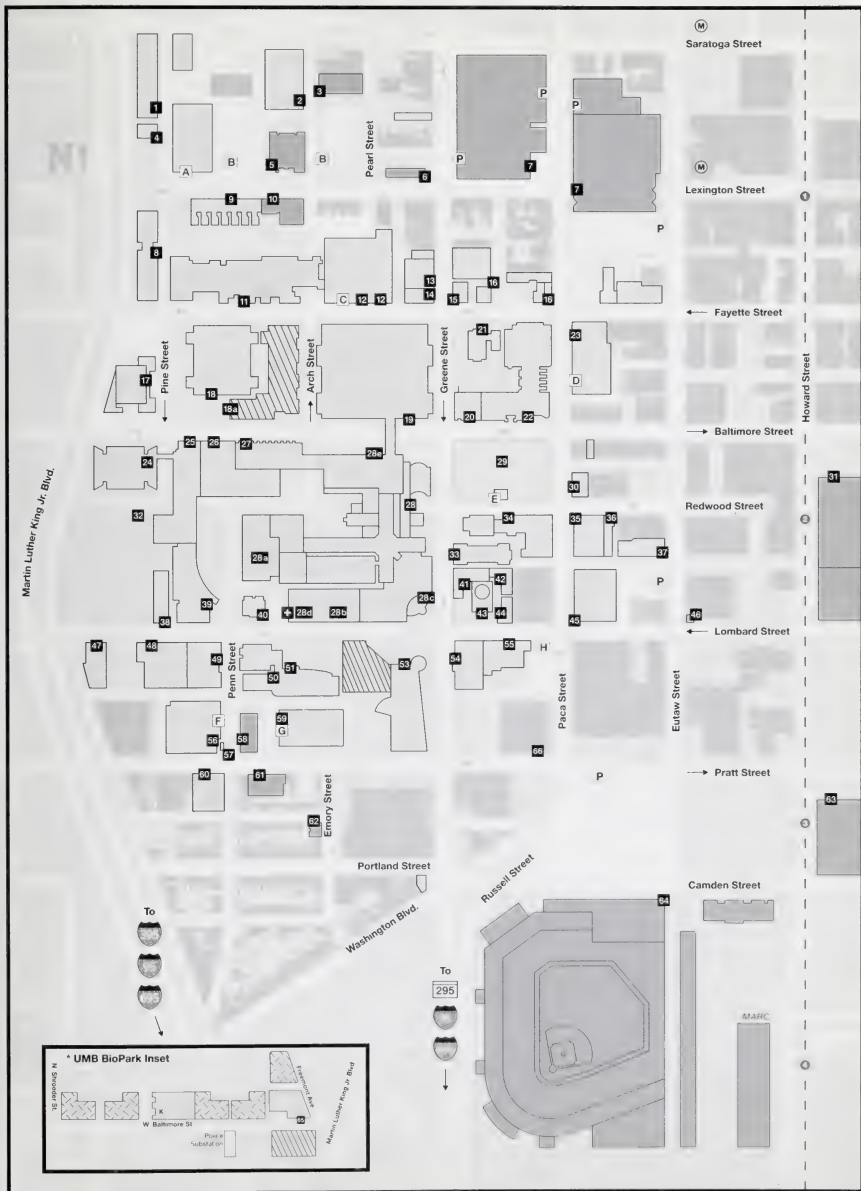
PATIENT CARE

701 W. Pratt St.	60
Dental School Hayden-Harris Hall 666 W. Baltimore St.	54
Green St. Bldg. 29 S. Greene St.	33
Homer Gudelsky Bldg. Lombard & Greene Sts.	28c
James T. Frenkil Bldg. 16 S. Eutaw St.	37
Pediatric Ambulatory Center 105 S. Penn St.	50
Shock Trauma Center Lombard & Penn Sts.	28a
Weinberg Building Lombard St.	28b

UM Family Medicine 29 S. Paca St.	45
UM Medical Center (UMMC) 22 S. Greene St.	28
UMMC Emergency Room Lombard St.	28d
UM Professional Bldg. 419 W. Redwood St.	35
UM Women's Health 120 Penn St.	56

NEIGHBORS

Babe Ruth Birthplace/ Museum 216 Emory St.	62
Baltimore Convention Center 1 W. Pratt St.	63
Bromo Seltzer Tower 312-318 W. Lombard St.	46
Downtown Baltimore Child Care 237 N. Arch St.	3
Hope Lodge 636 W. Lexington St.	5
Lexington Market 400 W. Lexington St.	7
Market Center Post Office 130 N. Greene St.	6
Maryland Institute for Emergency Medical Service Systems 653 W. Pratt St.	61
Maryland Pharmacists Association 650 W. Lombard St.	40
Old St. Paul's Cemetery	32
Oriole Park at Camden Yards 333 W. Camden St.	64
Ronald McDonald House 635 W. Lexington St.	10
State Medical Examiners Bldg. 111 Penn St.	58
Veterans Affairs Medical Center 10 N. Greene St.	19
Walter P. Carter Center 630 W. Fayette St.	11
1st Mariner Arena 201 W. Baltimore St.	31



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UNIVERSITY OF MARYLAND
SCHOOL OF PHARMACY

20 North Pine Street
Pharmacy Hall Room 730
Baltimore, Maryland 21201

