

**School  
of  
Public  
Health**



**Record of  
the University of  
North Carolina  
at Chapel Hill**

**April,  
1982**

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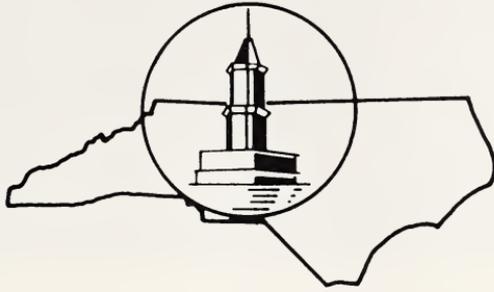
PUBLISHED BY  
THE UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL  
CHAPEL HILL, N.C.

Issued 16 times a year as follows: 1 in August, 2 in December, 3 in January,  
2 in February, 3 in March, 3 in April, 1 in May, and 1 in June

Pub. No. 651960

Second-class postage paid at Chapel Hill, N.C. 27514-6201

Send all Undeliverable Copies and Changes of Address to Deans Office, School  
of Public Health, 201-H, The University of North Carolina at Chapel Hill, Chapel Hill,  
N.C. 27514-6201



# **school of public health**

## **record of the university of north carolina at chapel hill**

(USPS 651-960)

**announcements for the session 1982-1983  
the university of north carolina at chapel hill**

**the one hundred and eighty-eighth session**

**april 1982  
number 928**

# the university of north carolina

sixteen constituent institutions

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## History of the University

The University of North Carolina is comprised of all the public institutions of higher education in North Carolina that confer degrees at the baccalaureate level or higher. The University was authorized by the State Constitution in 1776, and it was chartered in 1789 by the General Assembly.

The University of North Carolina opened its doors to students at Chapel Hill in 1795. Thereafter, beginning in the latter part of the nineteenth century, the General Assembly of North Carolina has established and supported fifteen other public senior institutions in keeping with Article IX, Section 8, of the Constitution of North Carolina which provides that the "General Assembly shall maintain a public system of higher education, comprising The

University of North Carolina and such other institutions of higher education as the General Assembly may deem wise."

By 1969 The University of North Carolina included six constituent institutions, governed by a single Board of Trustees. This multicampus University had its beginnings in legislation enacted in 1931 that defined The University of North Carolina to include The University of North Carolina at Chapel Hill, North Carolina State University at Raleigh, and The University of North Carolina at Greensboro. In the 1960s three additional campuses were added: The University of North Carolina at Charlotte, The University of North Carolina at Asheville, and The University of North Carolina at Wilmington.

Beginning in 1877, the General Assembly of North Carolina established or acquired ten additional separately governed state-supported senior institutions of higher education. They are: Appalachian State University, East Carolina University, Elizabeth City State University, Fayetteville State University, North Carolina Agricultural and Technical State University, North Carolina Central University, North Carolina School of the Arts, Pembroke State University, Western Carolina University, and Winston-Salem State University. Then, in 1971, the General Assembly redefined The University of North Carolina, and under the terms of that legislation all sixteen public senior institutions became constituent institutions of The University of North Carolina.

The constitutionally authorized Board of Trustees of the six-campus University of North Carolina was designated the Board of Governors and this body is by law The University of North Carolina. The Board of Governors consists of thirty-two members elected by the General Assembly, and it is charged with "the general determination, control, supervision, management, and governance of all affairs of the constituent institutions." The chief executive officer of the University is the President.

Each constituent institution of the University has its own faculty and student body. The chief administrative officer of each institution is the chancellor, and the chancellors are responsible to the President.

Each constituent institution also has a board of trustees composed of thirteen members: eight elected by the Board of Governors, four appointed by the Governor, and the elected president of the student body *ex officio*. (The School of the Arts has two additional *ex officio* trustees.) The principal powers of these institutional boards are exercised under a delegation of authority from the Board of Governors.

The University of North Carolina at Chapel Hill is committed to equality of educational opportunity and does not discriminate against applicants, students, or employees based on race, color, national origin, religion, sex, age, or handicap. Any complaints alleging failure of this institution to follow this policy should be brought to the attention of the Assistant to the Chancellor. Moreover, The University of North Carolina at Chapel Hill is open to people of all races and actively seeks to promote racial integration by recruiting and enrolling a larger number of black students.

## table of contents

<b>the university of north carolina at chapel hill</b>	2
<b>university calendar</b>	3
<b>university policies and information</b>	6
Admission	6
Policies	6
Application	6
Tuition and Fees	7
Residence Status for Tuition Payment	8
Statutory Exceptions	9
Registration and Payment of Bills	14
Automobile Regulations	14
Student Services	15
Directory Information	16
<b>school of public health</b>	18
Dean's Office	18
Administrative Board	18
Dean's Cabinet	19
General Information	20
Academic Information	22
Financial Assistance	35
Student Union	36
<b>the departments</b>	37
Biostatistics	37
Environmental Sciences and Engineering	40
Epidemiology	49
Health Education	51
Health Policy and Administration	54
Maternal and Child Health	57
Nutrition	61
Parasitology and Laboratory Practice	64
Public Health Nursing	67
<b>the division</b>	70
<b>special programs</b>	72
<b>faculty</b>	74
<b>courses of instruction</b>	93

# the university of north carolina at chapel hill



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# university calendar

1982-1983



1982-1983

## Summer Session, 1982

### First Term

May 24, Monday	Registration.
May 25, Tuesday	First day of classes.
May 26, Wednesday	Last day for late registration.
May 31, Monday	Holiday, Memorial Day.
June 1, Tuesday	Last day to drop a course for credit on student's financial account.
June 11, Friday	Last day to drop courses (undergraduates).
June 14, Monday	Last day to withdraw for credit on student's financial account.
June 18, Friday	Last day to drop courses (graduates).
June 25, Friday	Last day of classes.
June 26, Saturday	Reading day.
June 28-29, Monday-Tuesday	Final examinations.

### Second Term

July 6, Tuesday	Registration.
July 7, Wednesday	First day of classes.
July 8, Thursday	Last day for late registration.
July 13, Tuesday	Last day to drop a course for credit on student's financial account.
July 23, Friday	Last day to drop courses (undergraduates).
July 27, Tuesday	Last day to withdraw for credit on student's financial account.
July 30, Friday	Last day to drop courses (graduates).
August 6, Friday	Last day of classes.
August 7, Saturday	Reading day.
August 9-10, Monday-Tuesday	Final examinations.

## Fall Semester, 1982

August 11, Wednesday	Fall Semester opens.
August 15, Sunday	Residence halls open for freshmen and undergraduate transfer students.
August 16-17, Monday-Tuesday	Orientation of all new freshmen and undergraduate transfer students according to schedule to be announced.
August 18, Wednesday	Residence halls open for returning students.
August 18-20, Wednesday-Friday	Registration according to schedule to be announced.
August 23, Monday	Classes begin for all students. Late registration begins. Fee of \$5.00 charged for late registration.
August 27, Friday	End of late registration and change in schedules. No registration accepted after this date.
September 6, Monday	Holiday, Labor Day.
September 7, Tuesday	Last day to drop a course for credit on student's financial account.
September 24, Friday	Last day for graduate students to file applications with Dean for degree to be awarded in December.
October 1, Friday	Last day for dropping courses (undergraduates) and last day for Pass/Fail declarations.
October 5, Tuesday	Last day for filing applications with Dean for degrees to be awarded in December (undergraduates).
October 6, Wednesday	Fall Recess—Instruction ends 5 P.M.
October 11, Monday	Instruction resumes 8 A.M.
October 12, Tuesday	University Day.
October 15, Friday	Progress Reports for freshmen due.
October 22, Friday	Last day to withdraw for credit on student's financial account. Last day to withdraw without the semester being counted as a term in residence (undergraduates only).
October 25-29, Monday-Friday	Pre-registration for Spring Semester.
November 13, Saturday	Written examinations for master's candidates for December graduation may not be taken after this date.
November 19, Friday	Last day for graduate students to drop a course.
November 24, Wednesday	Thanksgiving Recess—Instruction ends 1 P.M.
November 29, Monday	Instruction resumes 8 A.M.
December 3, Friday	Fall Semester classes end.
December 6, Monday	Reading day.
December 7, Tuesday	Fall Semester examinations begin.
December 10, Friday	Final signed copies of doctoral dissertations and master's theses for candidates for the December graduation must be filed in the Graduate School by this date.
December 16, Thursday	Fall Semester examinations ends.

## Spring Semester, 1983

January 9, Sunday	Spring Semester opens.
January 9 (noon), Sunday	Residence halls open for new students.
January 10, Monday	Residence halls open for returning students.
January 10-11, Monday-Tuesday	Registration/schedule changes.

January 12, Wednesday	Classes begin for all students. Late registration begins. Fee of \$5.00 charged for late registration.
January 18, Tuesday	End of late registration and change in schedules. No registration accepted after this date.
January 25, Tuesday	Last day to drop a course for credit on student's financial account.
January 28, Friday	Last day for graduate students to file applications with Dean for degree to be awarded in May.
February 4, Friday	Last day for filing applications with Dean for degree to be awarded in May (undergraduates).
February 22, Tuesday	Last day for dropping courses (undergraduates) and last day for Pass/Fail declarations.
March 4, Friday	Spring Recess—Instruction ends 5 P.M.
March 14, Monday	Instruction resumes 8 A.M.
March 15, Tuesday	Last day to withdraw for credit on student's financial account. Last day to withdraw without the semester being counted as a term in residence (undergraduates only).
March 26, Saturday	Written examinations for master's candidates for May graduation may not be taken after this date.
April 4, Monday	Holiday, Easter Monday.
April 6-12 Wednesday-Tuesday	Pre-registration for summer and fall.
April 14, Thursday	Last day for graduate students to drop a course.
April 22, Friday	Final signed copies of doctoral dissertations and master's theses for candidates for the May graduation must be filed in the Graduate School by this date.
April 28, Thursday	Spring Semester classes end.
April 29, Friday	Reading day.
May 2, Monday	Spring Semester examinations begin.
May 11, Wednesday	Spring Semester examinations end.
May 15, Sunday	Commencement.



# university information

## Admission

### Policies

The regular entrance requirements of the Graduate School must be met by all students applying for admission to the School of Public Health.

The applicant must hold the bachelor's or master's degree from an accredited college or university with a grade average of B or better in the major subject area and must present credentials showing the completion of prerequisite courses for the special field he or she proposes to undertake in a graduate program. Only applicants with academic records of high quality should seek admission. All applicants with less than a 3.0 average in the last two years of undergraduate work must take the Graduate Record Examination.

Work done in absentia will not be counted for graduate credit. However, in certain cases approved by the University Administration, part of the work on the thesis for a higher degree may be done elsewhere. All such work, even when credited, is subject to the final examination required for the degree.

All master's degrees are terminal degrees. To enroll in the doctoral program, the student must receive approval of the department and be readmitted to the Graduate School.

All new students, and all old students who have been out of the University for a full calendar year or more, must have a medical report submitted to and approved by the Director of the Student Health Service before their registrations may be effected. Those who arrive in Chapel Hill without completing these requirements must defray the costs of having the physical examination, laboratory examinations, and immunizations performed by the Student Health Service.

### Application

All applicants are required to pay a \$15.00 non-deductible, non-refundable application fee to the Graduate School.

The program of study in the School of Public Health is arranged in a sequence which makes it advisable for students to enter the School in the fall semester. Admission at other times is granted only for exceptional reasons.

Letters of inquiry regarding admission and requests for application forms should be addressed to the Dean, School of Public Health, Rosenau Hall 201-H, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27514-6201. It is advisable to apply for fall admission before February 1, although applications submitted as late as July 1 will be considered if space is available. To compete with heavy competition, applications and all supporting documentation should be received in the Graduate School by February 15.

An individual can be considered for a Graduate School Fellowship only when all materials are received by January 21. Information about School of Public Health traineeships, scholarships and other financial assistance appears on page 35 of this catalog. Additional information can be obtained from the departments.

An applicant who has been offered admission reserves his or her place by payment of a \$25.00 non-refundable enrollment deposit which is credited against the 1st semester tuition. Checks should be made payable to The University of North Carolina. Payment should be mailed directly to the University Cashier, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27514-6201, along with an Admission and Deposit Record. No payment should be sent either to the Graduate School, to the School of Public Health, or to the department of one's major. Due to the number of applicants, your place will not be held if this deposit is not received within three weeks of the date of the admission letter.

Students who make the deposit and who attend the University on a fellowship, traineeship, or other award which pays the entire cost of tuition and fees directly to the University may obtain refund of the deposit after November 1.

### Tuition and Fees<sup>1</sup>

Graduate tuition and fees per semester for bona fide residents of North Carolina are \$488.75. For out-of-state students, tuition and fees per semester are \$1,256.75. In addition, the following courses require field experience for which there is a fee:

BIOS 301	\$150.00	PHNU 272	\$300.00	HEED 240	\$450.00
PHNU 301	\$150.00	NUTR 158	\$350.00	HEED 340	\$450.00
ENVR 164	\$175.00	BIOS 302	\$450.00	MHCH 214	\$450.00
ENVR 165	\$200.00	EPID 315	\$650.00	NUTR 251	\$450.00
HADM 90	\$200.00	HADM 206	\$450.00	PHNU 396	\$450.00

Undergraduate tuition and fees per semester for residents of North Carolina are: \$346.75; for out-of-state students, \$1,258.75.

<sup>1</sup>Tuition and fees are subject to change without notice. Amounts given are for semester system. Additional field fee courses may be established.

Tuition and fees are due at registration. Accounts not paid in full by the last day of registration are subject to a late payment fee and the student's possible disenrollment.

The curricula of certain of the departments extend through a summer period of 12 weeks. For each six week period, tuition and fees for graduate students are \$188.00 for in-state, and \$495.00 for out-of-state students.

Thesis—0 credit hours for in-state \$226.75 and out-of-state is \$326.75 per semester or \$88.00 per summer term.

## Residence Status for Tuition Purposes

The following sections summarize important aspects of the residency law. A complete explanation of the Statute and the procedures under the Statute is contained in *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes*. This *Manual* and other information concerning the application of this law is available for inspection in the Admissions Offices of the University. Copies of the *Manual* are also on reserve at the Robert B. House Undergraduate Library.

All students are responsible for knowledge of the contents of the Statute and the *Manual*.

**General.** Every applicant for admission is required to make a statement as to his or her length of residence in North Carolina. The tuition charge for legal residents of North Carolina is less than for nonresidents. To qualify for in-state tuition, a legal resident must have maintained his or her domicile in North Carolina for at least twelve months immediately prior to the beginning of the term for which classification as a resident for tuition purposes is sought. The student must also establish that his or her presence in the State during such twelve-month period was for purposes of maintaining a bona fide domicile rather than for purposes of mere temporary residence incident to enrollment in an institution of higher education. A student seeking classification as a resident for tuition purposes must complete an application for resident status (obtainable at his or her admissions office) and return it to the proper admissions office. Every student must be classified either resident or nonresident before enrolling. Unless the student supplies enough information to allow the admissions officer to classify the student as a resident-for-tuition-purposes, the student will be classified a nonresident for tuition purposes.

**Domicile.** Domicile means one's permanent dwelling place of indefinite duration, as distinguished from a temporary place of abode; synonymous with "legal residence."

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<sup>2</sup>The information in this section comes from three sources: (i) North Carolina General Statutes, Sec. 116-143.1, (ii) *A Manual to Assist the Public Higher Education Institutions of North Carolina in the Matter of Student Residence Classification for Tuition Purposes*, Revised August 1981, (iii) Chancellor's Rules and Procedures for Residence Classification of Students for Tuition Purposes.

**Burden of Proof and Statutory Prima Facie Evidence.** The student has the burden of establishing facts which justify his or her classification as a resident-for-tuition-purposes. The balancing of all the evidence must produce a preponderance of evidence supporting the assertion of in-state residence. Under the statute proof of resident status is controlled initially by one of two evidentiary beginning points which are stated in terms of prima facie evidence.

a. Even if the student is an adult, if his or her parents (or court-appointed guardian in the case of some minors) are not legal residents of North Carolina, this is prima facie evidence that the student is not a legal resident of North Carolina unless the student has lived in this state the five consecutive years prior to enrolling or re-registering. To overcome this prima facie showing of nonresidence, the student must produce evidence that he or she is a North Carolina domiciliary despite the parents' nonresident status.

b. Conversely, if the parents of the student are domiciliaries of North Carolina under the Statute, this fact constitutes prima facie evidence that the student is a domiciliary of North Carolina. This prima facie evidence may also be overcome by other evidence of legal residence. If the student has neither living parents nor legal guardian, the prescribed prima facie evidence rule cannot and does not apply.

**Statutory Exceptions**

a. *Grace Period.* If a student has been properly classified as a resident-for-tuition-purposes and, thereafter, his or her state of legal residence changes, the student does not automatically lose the benefit of the in-state tuition rate immediately. Instead the statute provides for a grace period if the following conditions are satisfied:

1. The student must have been properly classified as a resident for tuition purposes, on the basis of a valid finding that the student in fact was a legal resident of North Carolina and had been such for the requisite twelve-month period prior to classification;
2. At the time of subsequent change of legal residence to a state other than North Carolina, the student must have been enrolled in a public institution of higher education in North Carolina.

The extent of this grace period (during which the in-state rate is applicable in spite of the fact that the student is not a legal resident of North Carolina) is twelve months from the date of change in legal residence plus any portion of a semester or academic term remaining, as of the expiration date of the twelve-month period, in which the student is enrolled.

b. *Qualifying Periods for Spouses.* By virtue of the provisions of G.S. 116-143.1, if a student otherwise can demonstrate compliance with the fundamental statutory requirement that he or she be a legal resident of North Carolina, the second statutory requirement relating to duration of residence may be satisfied derivatively, in less than twelve months, by reference to the length of the legal residence of the spouse of the student, if the spouse has been a legal resident of the State for the requisite twelve-month period.

c. *Reacquisition of Resident Tuition Status.* The prescribed twelve-month period of legal residence may also be shortened if the person seeking to be classified as a resident for tuition purposes was formerly classified a North Carolina resident for tuition purposes, abandoned North Carolina domicile, and re-established North Carolina domicile within twelve months after abandoning it. Students should consult their admissions offices for a detailed explanation of the conditions which must be met to qualify under this section.

**Married Persons.** The domicile of a married person, irrespective of sex, is determined by reference to all relevant evidence of domiciliary intent. No person is precluded, solely by reason of marriage to a person domiciled outside of North Carolina, from establishing or maintaining legal residence in North Carolina. No person is deemed, solely by reason of marriage to a person domiciled in North Carolina, to have established or maintained a legal residence in North Carolina. The fact of marriage and the place of the domicile of his or her spouse are deemed relevant evidence to be considered in ascertaining domiciliary intent.

**Minors.** A minor is any person who has not reached the age of eighteen years. The domicile of a minor is that of the father. With a few exceptions noted below, this presumption is virtually irrebuttable. If the father is deceased, the domicile of the minor is that of the surviving mother. If the parents are divorced or legally separated, the domicile of the minor is that of the parent having custody by virtue of a court order; or, if no custody has been granted by virtue of court order, the domicile of the minor is that of the parent with whom he or she lives; or, if the minor lives with neither parent, in the absence of a custody award, the domicile of the minor is presumed to remain that of the father.

In determining residence status for tuition purposes, there are two exceptions to the above provisions:

1. If a minor's parents are divorced, separated, or otherwise living apart and one parent is a legal resident of North Carolina, during the time period when that parent is entitled to claim, and does claim, the minor as a dependent on the North Carolina individual income tax return, the minor is deemed to be a legal resident of North Carolina for tuition purposes, notwithstanding any judicially determined custody award with respect to the minor.

If, immediately prior to his or her eighteenth birthday, a person would have been deemed to be a North Carolina legal resident under this provision but he or she achieves majority before enrolling in an institution of higher education, that person will not lose the benefit of this provision if the following conditions are met:

- a. Upon achieving majority the person must act, as much as possible, in a manner consistent with bona fide legal residence in North Carolina; and

- b. The person must begin enrollment at an institution of higher education not later than the fall academic term next following completion of education prerequisite to admission at the institution.

2. If, immediately prior to beginning an enrolled term, the minor has lived in North Carolina for five or more consecutive years in the home of an adult relative (other than a parent) who is a legal resident of North Carolina, and if the adult relative, during those years, has functioned as a de facto guardian



of the minor, then the minor is considered a legal resident of North Carolina for tuition purposes. If a minor qualified for resident status for tuition purposes under this provision immediately prior to his or her eighteenth birthday, then, when he or she reaches the age of eighteen, he or she will be deemed to be a legal resident of North Carolina of at least twelve months' duration.

Even though a person is a minor, under certain circumstances the person may be treated by the law as being sufficiently independent from his or her parents as to enjoy a species of adulthood for legal purposes. If the minor marries or obtains a judicial decree of emancipation under N.C. Gen. Stat. §7A-717, *et seq.*, he or she is emancipated. The consequence, for present purposes, of such emancipation is that the affected person is presumed to be capable of establishing a domicile independent of that of the parents; it remains for that person to demonstrate that a separate domicile in fact has been established.

**Aliens.** Aliens who are permanent residents of the U.S., or who hold a visa which will permit eventual permanent residence in the U.S., are subject to the same considerations with respect to determination of legal residence as citizens. An alien abiding in the United States under a visa conditioned at least in part upon intent not to abandon a foreign domicile (B, F, H, and J visas) cannot be classified a resident. An alien abiding in the United States under a visa issued for a purpose which is so restricted as to be fundamentally incompatible with an assertion by the alien of bona fide intent to establish a legal residence (C and D visas) cannot be classified a resident.

Under a special statute, a refugee or orphan from the Republic of Vietnam, Laos, or Cambodia, paroled into the United States after March 31, 1975, who has abided in this state for twelve consecutive months may receive in-state

tuition privileges. No one shall be eligible for this special benefit for any term which ends after July 1, 1982.

Possession of certain other immigration documents may allow an alien to be considered for in-state tuition status. For more details aliens should consult their admissions offices and the *Manual*. Aliens must file a Residence Status Supplemental Form in addition to the forms normally required of applicants for resident-status-for-tuition-purposes.

**Military Personnel.** The domicile of a person employed by the Federal Government is not necessarily affected by assignment in or reassignment out of North Carolina. Such a person may establish domicile by the usual requirements of residential act plus intent. No person loses his or her in-state resident status solely by serving in the armed forces outside of the State of North Carolina.

**Prisoners.** There are special provisions concerning domicile of prisoners. For more information, persons to whom these provisions may apply should consult the *Manual*.

**Property and Taxes.** Ownership of property in or payment of taxes to the State of North Carolina apart from legal residence will not qualify one for the in-state tuition rate.

**Change of Status.** A student admitted to initial enrollment in an institution (or permitted to re-enroll following an absence from the institutional program which involved a formal withdrawal from enrollment) is classified by the admitting institution either as a resident or as a nonresident for tuition purposes prior to actual matriculation. In the absence of a current and final determination by the admitting institution that the student is a resident for tuition purposes, relative to the term of initial enrollment or re-enrollment, the student is classified a nonresident for tuition purposes prior to actual matriculation. A residential classification once assigned (and confirmed pursuant to any appellate process invoked) may be changed thereafter (with a corresponding change in billing rates) only at intervals corresponding with the established primary divisions of the academic calendar.

**Transfer Students.** When a student transfers from one North Carolina public institution of higher education to another, he or she is treated as a new student by the institution to which he or she is transferring and must be assigned an initial residential classification for tuition purposes.

The transfer into or admission to a different component of the same institution (e.g., from an undergraduate to a graduate or professional program) is not construed as a transfer from one institution to another and thus does not by itself require a reclassification inquiry unless (1) the affected student requests a reclassification inquiry or (2) the transfer or enrollment occurs following the lapse of more than one quarter, semester, or term during which the individual was not enrolled as a student.

**Responsibility of Students.** Any student or prospective student in doubt concerning his or her residence status must bear the responsibility for securing a ruling by completing an application for resident status and filing it with the admissions officer. The student who, due to subsequent events, becomes eligible for a change in classification, whether from out-of-state to in-state or the reverse, has the responsibility of immediately informing the Office of Admissions of these circumstances in writing. Failure to give com-

plete and correct information regarding residence constitutes grounds for disciplinary action.

It is the responsibility of the student to pay tuition at the rate charged and billed while an appeal is pending. In effect, the student who is classified as a nonresident at the time of tuition billing pays the nonresident rate. Conversely, if a student is classified as a resident at the time of billing, he or she pays the resident rate. Any necessary adjustments in the rate paid will be made at the conclusion of the appeal.

If a student, who has been found to be a nonresident for tuition purposes, receives an erroneous notice from an institutional officer identifying the student as a resident for tuition purposes, the student is not responsible for paying the out-of-state tuition differential for any enrolled term beginning before the classifying institution notifies the student that the prior notice was erroneous.

If a student is classified a resident for tuition purposes after submitting falsified residentiary information or after knowingly withholding residentiary information, the student's application for in-state tuition status is fraudulent. The institution may re-examine any application suspected of being fraudulent, and, if warranted, will change the student's residence status retroactively to the beginning of the term with respect to which the student originally made the fraudulent application. If this occurs the student must pay the out-of-state tuition differential for all the enrolled terms intervening between the fraudulent application and its discovery. Further, knowing falsification of responses on a resident status application may subject the applicant to disciplinary consequences, including dismissal from the institution.

**Appeals of Rulings of Admissions Officers.** A student appeal of a classification decision made by any admissions officer must be in writing and signed by the student and must be filed by the student with that officer within fifteen working days after the student receives notice of the classification decision. The appeal is transmitted to the Residence Status Committee by that officer, who does not vote in that committee on the disposition of such appeal. The student is notified of the date set for consideration of the appeal, and, on request of the student, he or she is afforded an opportunity to appear and be heard by the Committee. Any student desiring to appeal a decision of the Residence Status Committee must give notice in writing of that fact, within ten days of receipt by the student of the decision of the Committee, to the Chairman of the Residence Status Committee, and the Chairman promptly processes the appeal for transmittal to the State Residence Committee.

Students or prospective students who believe that they are entitled to be classified residents for tuition purposes should be aware that the processing of requests and appeals can take a considerable amount of time and that applications for classification should not be delayed until registration, when the number of applications make accelerated handling impossible.

## Registration and Payment of Bills

All students are expected to report for registration on the opening date of the fall semester.

Bills for the fall and spring semester are payable at the University Cashier's Office no later than the first day of classes for each semester. Failure to pay as specified will result in the assessment of a late payment fee and possible disenrollment. This ruling does not apply to fellowship students or students who are sent by agencies.

## Automobile Regulations

Students at the University who own and/or operate a motor vehicle on campus, and are eligible for and desire campus parking privileges, may register their vehicles with the Traffic Office, "Y" Building, in order to secure and display on the vehicle a permit indicating eligibility for parking privileges.

For returning students, applications requesting motor vehicle parking permits must be submitted before the Spring Semester ends; these are processed and permits are issued during fall registration. Transfer and new students will be given an opportunity to register their automobiles or motorcycles during the fall registration. A check or direction to charge the student's account must accompany the application.

In addition, permits allowing unlimited rides on the Chapel Hill Transportation System buses may be purchased by the semester from the UNC Traffic Office, "Y" Building. Students wishing to use this bus system instead of paying for campus parking may park off campus in a perimeter lot for a small fee.

Bus schedules and a complete set of rules and regulations governing parking and traffic will be furnished to each student at the time a parking permit is issued.



## Student Services

### Housing

Student housing is an integral part of the educational program. The primary objective of the Department of University Housing is to provide a physical and psychological atmosphere which allows the student to develop to the utmost his or her personality, ability, and sensitivity. The University maintains residence hall space in 29 buildings for more than 6,600 registered students—undergraduate, graduate and professional men and women. In Craige Graduate Center five of the seven floors are reserved for graduate students. Three hundred and six apartments are available for married students.

Information regarding residence hall accommodations is available by writing to: Department of University Housing, Contracts Office, Carr Building 103-A, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27514-6201.

Information regarding married student housing is available by writing to: Manager, UNC Family Student Housing, Odum Village, Branson Street, Chapel Hill, North Carolina 27514-6201.

Nearly 800 women and 700 men are housed in privately owned Granville Towers, which is located just off the UNC-CH campus about one block from the Carolina Inn. These supervised residence halls have a cafeteria dining commons. The fee charged includes room and board. Information is available from Granville Towers, University Square, Chapel Hill, NC 27514-6201. Arrangements for these accommodations should be made directly with Granville Towers Business Office.

### Laundry and Linen

Finished laundry service at reasonable cost is provided by the University Laundry to students who wish to use it. There is also an economical wash-dry-fold service (nothing finished). Both services are available on a cash-and-carry basis at any six laundry call offices.

A complete linen rental service is also available through the University Laundry. The service consists of two sheets, one pillow case and three bath towels exchanged on a weekly basis through the seven laundry call offices. A fee of \$62.50 including a \$10.00 refundable deposit, covers the entire academic year and is payable when the service is requested. Pillows may be rented for \$2.00 for the school year with the linen; \$4.00 without. Blankets are available for a deposit of \$4.00 each, with a provision for a \$2.00 refund when the blanket and pillow are returned in good condition.

Complete dry cleaning service is available at all University laundry call offices on a cash-and-carry basis.

Coin-op service is available at Avery, Connor, Craige, Morrison, Odum Village and Spencer.

## **Student Health**

The University offers a comprehensive program of health care for its student body and provides a Student Health Service with both inpatient and outpatient facilities.

The Health Service is staffed with physicians, psychiatrists, clinical psychologists, counselors, health educators, and a full nursing complement. In addition to programs for physical and mental health, there is also a sports medicine program.

When a student is admitted to the infirmary, he is not charged for services rendered by the staff. He is, however, required to pay for any additional service—surgery, consultations, special nurses, etc.—recommended by the attending physician. (See the Graduate School Catalog for additional information).

The University also provides the opportunity to purchase supplemental hospitalization insurance through a group program which provides coverage for married students and their families as well as for single students.

## **Recreation**

The University gymnasium, swimming pools, tennis courts, golf course, and large athletic fields provide ample facilities for exercise and recreation, all under the supervision and direction of a well-organized Department of Physical Education.

## **Alcoholic Beverages, Drugs, and Smoking Ban**

The Graduate School Catalog carries a full statement of the University regulations and policies regarding the use of alcoholic beverages, improper use of drugs, and the smoking ban.

## **Libraries**

The Health Sciences Library is situated across the street from the School of Public Health. Reference librarians are available during almost all of the library's service hours to aid users in locating information, to instruct in the use of library's resources, and to provide additional research assistance. Automated reference services, including access to MEDLINE and over forty other data bases, are also available for on-line bibliographic searching.

Other library facilities include the various departmental and school libraries and the general University Library.

## **Notice on "Directory Information" to All Students of The University of North Carolina at Chapel Hill**

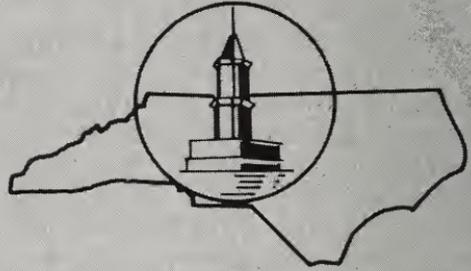
The University of North Carolina at Chapel Hill has routinely made public certain information about its students. Some typical ways this has been done include the following: names of students who are selected by the various honorary societies, who receive scholarships, who make the Dean's List, who

hold offices, or who are members of athletic teams are frequently made public. To facilitate campus communication the University annually publishes the *Campus Directory*. Some professional and graduate school student groups publish directories of students in their departments or schools. The annual commencement program publishes the names of persons who have received degrees during the year.

The Family Educational Rights and Privacy Act defines the term "directory information" to include the following categories of information: the student's name, address, telephone listing, date and place of birth, major field of study, participation in officially recognized activities and sports, weight and height of members of athletic teams, dates of attendance, degrees and awards received, and the most recent previous educational agency or institution attended by the student. The University will make public information about each student *limited* to these categories in ways such as those described above. Of course, information from all these categories is not made public in every listing. The *Campus Directory*, for example, publishes only names, addresses and telephone numbers.

Students who do not wish to have any or all of such "directory information" made public without their prior consent must notify the Office of Records and Registration, The University of North Carolina at Chapel Hill of this fact in a signed and dated statement specifying items that are not to be published. This notice must be received by the Office of Records and Registration by the end of the registration period for the semester or session of first enrollment or, after an absence, of re-enrollment, and by the end of each fall registration period thereafter.

# school of public health



## Dean's Office

- Bernard G. Greenberg**, B.S., Ph.D., Dean of the School of Public Health  
**Robert B. Moorhead**, B.A., M.P.A., Associate Dean for Administration  
**Dana Quade**, B.A., Ph.D., Associate Dean for Graduate Programs  
**Charles L. Harper**, B.A., M.S.P.H., Ph.D., Associate Dean for Community Health Service  
**Elizabeth J. Coulter**, A.B., A.M., Ph.D., Associate Dean for Undergraduate Programs  
**Ernest Schoenfeld**, A.A.S., B.S., M.P.H., Dr.P.H., Assistant Dean for Management and Operations  
**William T. Small**, B.S., M.S.P.H., Assistant Dean of Students  
**Emmy L. Palladino**, Registrar  
**Harriet H. Barr**, B.A., M.P.H., Director of Alumni Affairs and Public Relations

## Administrative Board

- James R. Abernathy**, B.S., M.S.P.H., Ph.D., Professor of Biostatistics  
**John B. Anderson**, M.A., Ph.D., Professor of Nutrition  
**Patricia Z. Barry**, B.S., M.A., Dr.P.H., Associate Professor of Health Administration  
**Karl E. Bauman**, A.B., M.A., Ph.D., Professor of Maternal and Child Health  
**Caroline Becker**, A.B., M.D., Associate Professor of Epidemiology  
**Robert Byrd**, B.S., J.D., Dean, School of Law  
**Bernard G. Greenberg**, B.S., Ph.D., Dean of the School and Kenan Professor of Biostatistics  
**Marion E. Highriter**, B.A., M.N., R.N., M.P.H., S.D. in Hgy., Associate Professor of Public Health Nursing  
**Joseph L. Holliday**, A.B., M.D., M.P.H., Health Director, Guilford County Health Department  
**Ronald Levine**, B.S., M.D., M.P.H., Director, NC Division of Health Services

**Eugene S. Mayer**, B.S., M.D., M.P.H., Professor of Family Medicine and Associate Dean, School of Medicine, and Director, Area Health Education Centers Program.

**Alvis G. Turner, Jr.**, B.S., M.S.P.H., Ph.D., Associate Professor of Environmental Sciences

### **Dean's Cabinet**

**Bernard G. Greenberg**, B.S., Ph.D., Dean of the School of Public Health and Kenan Professor of Biostatistics

**Russell F. Christman**, B.S., M.S., Ph.D., Professor of Environmental Sciences and Engineering

**Joseph C. Edozien**, D.Sc., M.D., F.R.C.P. (Ed), Path., Professor of Nutrition

**James Ennis Grizzle**, B.S., M.S., Ph.D., Professor of Biostatistics

**Charles L. Harper**, B.A., M.S.P.H., Ph.D., Associate Professor of Health Administration and Associate Dean for Community Health Service

**Michel A. Ibrahim**, M.D., M.P.H., Ph.D., Professor of Epidemiology

**Sagar C. Jain**, B.A., M.A., M.S., Ph.D., Professor of Health Administration

**C. Arden Miller**, M.D., Professor of Maternal and Child Health

**Dana Quade**, B.A., Ph.D., Professor of Biostatistics and Associate Dean of Graduate Programs.

**John Richard Seed**, A.B., Ph.D., Professor of Parasitology and Laboratory Practice

**Guy W. Steuart**, M.A., M.Ed., M.P.H., Ph.D., Professor of Health Education

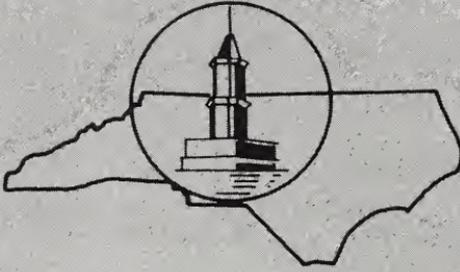
**Dorothy McComb Talbot**, B.S.N., M.A., M.P.H., Ph.D., Professor of Public Health Nursing

**Patricia M. Barron**, B.S., Student Representative

**Seth M. Steinberg**, B.A., M.S., Student Representative

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<sup>1</sup>Appointed Chairman, July 1, 1981



## general information

The School of Public Health was organized in 1936 as a division within the School of Medicine at The University of North Carolina. Separate status as a school of public health was granted in 1939 and the first graduate degrees awarded in 1940. The third school of public health in the nation, the UNC School of Public Health was the first such school established within a state university.

It is today, with the Schools of Medicine, Dentistry, Nursing and Pharmacy, a unit of the Division of Health Affairs. The original departments of the School were Epidemiology, Parasitology (changed in 1968 to Parasitology and Laboratory Practice), Public Health Administration (changed to Health Administration in 1969 and to Health Policy and Administration in 1982), and Sanitary Engineering (changed to 1962 to Environmental Sciences and Engineering). Five additional departments are currently operating: Biostatistics, Health Education, Maternal and Child Health, Nutrition, and Public Health Nursing.

The mission of the School is to advance and apply knowledge drawn from all sciences to the understanding and promotion of the health of human populations and to assist people in translating this knowledge into reality in their own lives whatever their culture or living conditions. The mission is realized through the education of students to assume professional positions, through providing continuing education opportunities for professionals and the public, through consultation and technical assistance to health and human service agencies and communities, through conducting applied and basic research, and through innovative demonstration programs.

All departments participate in research in a variety of areas and field service to the state, region and the nation. The Division of Community Health Service extends the service capabilities and promotes the School's commitment to community service as its public responsibility.

The School of Public Health is one of twenty-one such schools in the United States accredited by the Council on Education for Public Health. Three departments are accredited by other accrediting bodies: the Department of Public Health Nursing by the National League for Nursing, the Department

of Environmental Sciences and Engineering to offer the MSEE degree by the Accreditation Board for Engineering and Technology, and the Department of Health Policy and Administration by the Accrediting Commission on Education for Health Services Administration.

Degrees offered by the School of Public Health include an undergraduate degree (BSPH); the graduate academic degrees of Master of Science (MS); and Doctor of Philosophy (PhD); and the graduate professional degrees of Master of Public Health (MPH), Master of Science in Public Health (MSPH), Master of Science in Environmental Engineering (MSEE), and Doctor of Public Health (DrPh). All requirements of the graduate professional degrees are administered by the faculty of the School of Public Health with the approval of the Administrative Board of the Graduate School.

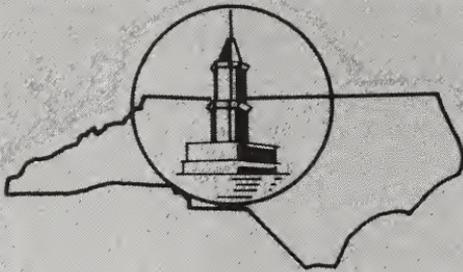
Close affiliations are maintained with other graduate schools and departments of the University of North Carolina campuses, as well as with other schools and universities, health and human services agencies and research organizations. These affiliations are local, statewide, national, and international in scope. The nature of the affiliations includes joint sponsorship and effort in teaching and research programs, joint faculty appointments, and establishment of field training centers for students in a number of official and voluntary international, federal, state and local health and human service organizations.

The University of North Carolina at Chapel Hill is committed to the principle of equal opportunity. It is the policy of this University not to discriminate on the basis of race, sex, color, national origin, religion, or handicap with regard to its students, employees or applicants for admission or employment. Discrimination is also prohibited by federal law. Any complaints alleging failure of this institution to follow a nondiscrimination policy should be brought to the attention of the Assistant to the Chancellor.

The School of Public Health has an active recruitment program for minorities. In addition during 1980, the School and the Federal Department of Health and Human Services supported an American Indian Recruitment program to assist American Indians in receiving health professions training.

Students in the School of Public Health have the same rights and privileges accorded all students at The University of North Carolina at Chapel Hill. They may take courses in other departments of the University, North Carolina State University, and Duke University, provided they are properly qualified and have the approval of their faculty advisers. Certain courses in chemistry, biochemistry, microbiology, economics, education, political sciences, social work, sociology, anthropology, and statistics have an especially close relationship to public health.

The School of Public Health admits only those students who would be expected to profit most by the educational program offered. It reserves the right to limit the number of students admitted to any course and drop from the roll any student whose work is unsatisfactory for any reason. It will be assumed that all applicants have assented to these conditions.



## **academic information**

### **Degrees Offered**

The School of Public Health offers one undergraduate degree, Bachelor of Science in Public Health, and six graduate degrees: Master of Public Health, Master of Science in Public Health, Master of Science, Master of Science in Environmental Engineering, Doctor of Philosophy, and Doctor of Public Health. Degrees are awarded in May, August, and December, although formal commencement exercises are held only in May. All Master's degrees are terminal degrees. Any student who desires to proceed in a doctoral program must be recommended to the Graduate School by his/her major department and be readmitted.

The general description of requirements for each degree follows. Explanation of the various programs of study in the different areas of specialization is found under the heading of each department in a later section in the catalog. Courses and programs described in this catalog have been approved by the University faculty and administration as of January 15, 1982. For full current information contact the department involved.

### **Bachelor of Science in Public Health**

A four-year course of study leads to the degree of Bachelor of Science in Public Health (BSPH). The first two years are typically spent in the General College of the University, or in equivalent academic study elsewhere. Upon successful completion of the appropriate freshman-sophomore work, the BSPH candidate transfers to the School of Public Health and then completes the final two years under the administration of this School. The course of study has five options for field of concentration: Biostatistics, Environmental Protection, Health Administration, Health Education, and Nutrition. All options require special studies outside as well as within the School of Public Health.

Since enrollment in the BSPH degree program is limited, completion of the

prescribed General College curriculum does not assure the student a position in the School of Public Health in the junior year. Student selections are made, typically in the latter half of the sophomore year of course-work, on a *competitive* basis with consideration of academic achievement and personal qualifications.

Requirements for the BSPH degree are as follows:

1. At least 120 semester hours, not counting physical education activities courses. A 2.0 (C) average or better on all work attempted at The University of North Carolina at Chapel Hill (which must be earned in a total number of hours not to exceed 45 beyond the minimum graduation requirement of 120 hours). The last 30 hours of degree credit to be taken in residence in Chapel Hill.
2. A freshman-sophomore pattern of approximately 60 credit hours in the General College, which must include English 1, 2; two courses from the Mathematical Sciences option of the General College; Zoology 11, 11L (or equivalent such as Biology 21, 21L if Zoology 45 will not later be needed); two physical education activities courses, and the following courses depending on the date of first enrollment as an undergraduate at the University of North Carolina at Chapel Hill:

**Students Entering the University as Freshmen From Fall 1982 to Fall 1984 or as Junior Transfers From Fall 1984 to Fall 1986:** placement or course work through Foreign Language 2 in the high school foreign language or course work through Foreign Language 3 in a newly elected foreign language; two Natural Sciences Perspective courses (which may include Zoology 11, 11L); two Social Sciences Perspective courses (from two different departments); two Aesthetic Perspective courses (one in literature and one in fine arts); one Philosophical Perspective course; two Western Historical Perspective courses (one primarily devoted to a period before 1700 and one covering a span of at least two centuries), with an option to substitute a Non-Western/Comparative Perspective course for one of the Western Historical Perspective courses as long as one pre-1700 course in the Western Historical Perspective is taken.

**Students Who Entered the University as Freshmen Before Fall 1982 or Who Enter as Junior Transfers Before Fall 1984:** Foreign Language 1, 2 satisfied at admission or after enrollment; two Natural Science Divisional Electives (which may include Zoology 11, 11L or Biology 21, 21L); three Social Science Divisional Electives selected from at least two departments; three Humanities and Fine Arts Divisional Electives chosen from at least two departments.

3. A junior-senior total of approximately 60 semester hours to include Biostatistics 101 (or 105 or 150), Environmental Sciences and Engineering 51, Epidemiology 160 (or 162), and a minimum of three electives outside the School of Public Health.
4. A satisfactory major in one of the five fields of concentration.

For additional information and specific requirements for each area of concentration see "The Undergraduate Bulletin" of the University.

## DEGREE PROGRAMS OFFERED IN SCHOOL OF PUBLIC HEALTH

	BSPH	MPH	MSPH	MS	MSEE	DrPH	PhD
Biostatistics	X	X	X	X		X	X
Environmental Sciences and Engineering	X	X	X	X	X		X
Epidemiology		X	X			X	X
Health Policy and Administration	X	X	X			X	X
Health Education	X	X	X			X	X
Maternal and Child Health		X	X			X	
Nutrition	X	X				X	
Parasitology and Laboratory Practice		X	X			X	X
Public Health Nursing		X		X			

### Master of Public Health

The program is designed to prepare students for positions which require a considerable breadth of knowledge of the whole field of public health but a lesser degree of specialization in one area. Thus students in this program may take nearly half of their courses outside the major department, and will undergo extensive field training if previous experience is not deemed sufficient by criteria set by the student's department. Typically, Master of Public Health students will have already acquired education in a health or health related profession, or have at least three years of experience in a field germane to public health.

The Master of Public Health degree is predominantly a terminal degree, but qualified students may proceed in the School of Public Health to a DrPH program for advanced study and further qualification.

#### *Field of Specialization*

Programs of study leading to the Master of Public Health degree are offered by all departments in the School. Detailed descriptions of these programs are found in the sections describing the departments in this catalog.

#### *Requirements for Admission*

1. a. A prior doctoral degree (such as MD, DVM, DDS, JD, or equivalent) from approved schools. Other doctoral degrees from approved

- schools may also qualify the applicant, depending upon the department to which application is being made and the relevance of the background to the department's field; or
- b. A prior master's degree (professional or academic) from approved schools provided the prior training is relevant to the basic field of the department to which the student is applying as determined by the policies of that department; or
  - c. A bachelor's degree from approved schools, including a strong undergraduate record overall, with an average grade of B or better in the subject of the major. The course content should meet the policies of the department to which the student is applying. Some departments require specific tests such as the GRE of applicants. Applicants with less than a B average in the subject of the major must take the GRE test.
2. In most departments, the applicant must have had relevant experience in a health related agency or organization prior to matriculation. Established departmental policy may credit experience prior to admission by reducing the length of the program or permitting a waiver for field training. The extent and nature of required field training is also subject to established departmental policy.
  3. Special additional requirements by departments, as specified.

## *Requirements for the Degree*

1. **Residence:** No less than two semesters are required, but a more extended period for majors in various programs may be needed in a number of departments. For those students in joint programs with selected other professional schools on this campus which have been approved by the Graduate School, credit toward one semester of residence may be obtained by enrolling in and receiving credit for at least fifteen semester hours (usually five courses) in the School of Public Health while registered in the other school. Students attempting to obtain the MPH degree simultaneously with another graduate school degree must register full time in the School of Public Health for at least one semester.
2. **Course Program:**
  - 2.1 Within the minimum of 30 semester hours needed for graduation in all departments, the School requires all students to satisfactorily complete at least five health related courses outside of their own department. The five courses must include the following:
    - a. A basic biostatistics course: BIOS 101, or an equivalent, or more advanced course in biostatistics;
    - b. A basic epidemiology course: EPID 160 (EPID 162 may be substituted by students in Environmental Sciences and Engineering and those receiving permission of the instructor);
    - c. A basic course in environmental sciences: ENVR 101 or ENVR 111, or ENVR 163, or ENVR 171, or ENVR 211, or ENVR 243;
    - d. A basic course in the operation and delivery of health services:



This may be HPA 105, or HPA 207, or one of several courses in various departments approved by the Department of Health Policy and Administration for this purpose;

- 2.2 Students may apply for exemption from courses listed above in items a., b., c., and d. on the ground that they have had equivalent experience, or comparable or more advanced courses. All exemptions must be approved by the student's academic adviser, the instructor of the exempted course, or by the Department of Health Policy and Administration in the instance of item d. above. Exemptions must be documented by filing a form with the Registrar from whom exemption forms can be obtained. If exemption is granted the student must still fulfill the requirement of five courses outside of the major department.
- 2.3 Additional courses of at least 9 semester hours in the specialized field as specified by the student's department.
3. **Admission to Candidacy:** An application for admission to candidacy which includes the total course program and title of written report (see below) must be filed with the Graduate School about three months before the expected date of graduation. The specific deadline is given in the calendar of events in this catalog.
4. **Written Report:** A major paper or other report is required by the Graduate School. Details are specified in policies established by individual departments.
5. **A Supervised Field Training** lasting 6 to 12 weeks, or a practicum within the department. Departmental policy may permit this requirement to be waived on grounds that

- (a) the student has had adequate prior supervised experience in the application of the methodology of the department of his specialty, and,
  - (b) the student has substituted a satisfactory learning experience which clearly serves his or her educational goals better than field training or a practicum would.
6. **Final Written or Oral Examination:** The examination must be taken at least one month before the degree is expected. The specific deadline is given in the calendar of events in this catalog. The focus is on work taken in the major department; but, depending on departmental policy, it may extend to other scientific and professional areas in which a department would expect its students to be knowledgeable.
7. **Time Limitation:** All requirements of the degree must be completed within five years from the time the student first matriculated in the program.

## Master of Science in Public Health

The Master of Science in Public Health program is designed to prepare students for professional careers in specialized areas of public health. Thus, its students will take courses mainly in one major department of the School of Public Health, although there are also core requirements which provide for orientation to a broader view of public health. The Master of Science in Public Health degree is usually terminal, but it and the Master of Science degree, more than the Master of Public Health, tend to be the precursor to a doctoral program.

### *Fields of Specialization*

Programs of study leading to the Master of Science in Public Health degree are offered by the following departments: Biostatistics, Environmental Sciences and Engineering, Epidemiology, Health Policy and Administration, Health Education, Maternal and Child Health, and Parasitology and Laboratory Practice. Descriptions of these programs are found in the sections describing the departments in this catalog.

### *Requirements for Admission*

1. A bachelor's degree from an approved school in a program that included course content as prescribed by approved policies of the department to which the student is applying;
2. A strong undergraduate record overall, with an average grade of B or better in the subject of the major. Some departments require specific tests such as the GRE of all applicants. Applicants with less than a B average in the subject of the major must take the GRE test.
3. Special additional and/or more stringent requirements by departments, as specified.

## Requirements for the Degree

1. **Residence:** A minimum period of residence of not less than two semesters is required. However, most students will need more time to satisfy the course requirements in specific programs. Students attempting to obtain the MSPH simultaneously with another Graduate School degree must register full time in the School of Public Health for one semester.
2. **Course Program:**
  - 2.1 Within the minimum of 30 semester hours needed for graduation in each department, all student must include the following courses required by the School:
    - a. A basic biostatistics course: BIOS 101 or equivalent or more advanced course in biostatistics.
    - b. A basic epidemiology course: EPID 160 (or EPID 162 for environmental students and those receiving permission of the instructor only).
    - c. A basic course covering either the physical or the social/behavioral factors which affect the health of the community.

Students may apply for exemption from these required courses on the ground that they have had equivalent or more advanced courses. All exemptions must be approved by the student's academic adviser, the instructor of the course, and the Associate Dean for Graduate Programs. Exemptions must be documented by filing a form with the Registrar. These forms can be obtained from the Registrar's office.
  - 2.2. Additional courses of at least 15 semester hours in the specialized field as specified by the department.
3. **Admission to Candidacy:** An application for admission to candidacy which includes the total course program and title of written report (see below) must be filed with the Graduate School about three months before the expected date of graduation. The specific deadline is given in the calendar of events in this catalog.
4. **Written Report:** A major paper or other report is required by the Graduate School. Details are specified in policies established by individual departments.
5. **Final Written or Oral Examination:** The examination must be taken at least one month before the degree is expected. The specific deadline is given in the calendar of events in this catalog. The focus is on work taken in the major department; but, depending upon departmental policy, it may extend to other scientific and professional areas in which a department would expect its students to be knowledgeable.
6. **Time Limitation:** All requirements of the degree must be completed within five years from the time the student first matriculated in the program.

## Master of Science

Programs of study leading to this degree are offered in the Department of

Biostatistics, Environmental Sciences and Engineering, and Public Health Nursing.

For guidelines on this degree program, the reader should refer to sections on the relevant departments, brochures produced by these departments, and the catalog of the Graduate School.

## Master of Science in Environmental Engineering

The curriculum leading to this degree is designed to prepare graduates for careers in the environmental engineering profession, with special emphasis on water resources and air and industrial hygiene. Specifically, those awarded this degree are prepared for professional work with private firms of consulting engineers; public agencies at the national, state, regional and local levels of government; and with a variety of industrial organizations.

### *Requirements for Admission*

Candidates for this degree must hold an engineering degree from an institution accredited by the Accreditation Board for Engineering and Technology or from an equivalent foreign institution—preferably in civil, environmental, or sanitary, chemical, or mechanical engineering—where the curriculum has involved fundamental work in chemistry, physics, mathematics, and the engineering sciences.

### *Requirements for the Degree*

1. **Residence.** A minimum of one calendar year (12 months) of residence for students who have graduated with a strong record from approved engineering schools.
2. **Course Program.** Upon admission, students are required to develop a program of courses in consultation with their academic advisers. The program must include sufficient breadth to satisfy minimum course requirements described elsewhere in this catalog. For all students, a minimum of 30 graduate credits is required.
3. **Admission to Candidacy.** Students must file an application with the Graduate School for admission to candidacy about three months before the expected date of graduation. The specific deadlines are given in the calendar of events in this catalog.
4. **Written Report.** All students must prepare a written report on a technical investigation. The technical report is due approximately one month before the expected date of graduation. Deadlines are announced in the Department of Environmental Sciences and Engineering. The topic of the report must be approved by the student's adviser, and the work of the study must be carried out under his direction. The goal of the written report is to prepare students for conducting and reporting on independent investigations of some magnitude in their chosen field of study.
5. **Final Oral Examination.** About one month before the expected date of graduation, students are given a final oral examination which focuses on their program of study, including the written report. Deadlines are

announced in the Department of Environmental Sciences and Engineering.

6. **Time Limitation.** All requirements for the degree must be completed within five years of the time the student matriculated in the program.

## **Doctor of Public Health**

The Doctor of Public Health (DrPH) program provides professional training to prepare persons for the effective conduct or supervision of research, usually of an applied nature, and the integration of new knowledge and techniques into community and/or public health practice. Graduates are typically employed by operating community or public health programs at the local, state, national or international levels.

### *Fields of Specialization*

Programs leading to the Doctor of Public Health degree are offered by the Departments of Biostatistics, Epidemiology, Health Policy and Administration, Health Education, Maternal and Child Health, Nutrition, and Parasitology and Laboratory Practice.

### *Requirements for Admission*

A prior master's or doctoral degree in public health or a related field is generally required. However, students in MPH or MSPH programs at the School may be admitted to the DrPH program without formally acquiring the master's degree, provided they satisfy all course requirements for the MPH degree.

At least 12 months of significant experience in public health is also required, but this may be included as part of the DrPH program before formal admission to candidacy.

### *Requirements for the Degree*

1. **Time:** A minimum of two academic years of course work and directed research, including at least two semesters of full-time continuous residence. This must be in addition to any time needed for satisfying the requirements for admission to the program. Students attempting to obtain the DrPH degree simultaneously with another Graduate School degree must register full time in the School of Public Health at least two semesters.
2. **Course Program:** A minimum of 18 semester hours of course work beyond the master's degree over and above MPH core courses are required for admission to candidacy and dissertation and research courses. The specific courses to be taken and number of credits will depend upon the qualifications and field of interest of the individual student. However, inasmuch as acquisition of this degree requires broad knowledge, students will of necessity take courses outside of

their own department from within the School of Public Health, other parts of the University, or in other universities.

3. **Doctoral Committee:** Individual departments may, at the early stage of the program, establish a group of course advisers to direct and supervise the student's course work. The group may later become the dissertation committee. The doctoral student should play a significant role in selecting members of the committee.

The dissertation committee shall consist of no fewer than five members, one of whom shall be named chairman, and at least three of whom shall be full members of the Graduate Faculty. Others may be limited members of the Graduate Faculty or "special appointees" approved by the Graduate School. Committee members shall be nominated by the director of the departmental doctoral program using the "Recommendation for Composition of Doctoral Dissertation Committee" form which must be transmitted via the School of Public Health's Associate Dean for Graduate Programs to the Graduate School for approval. This committee will examine and approve the dissertation prospectus, either as part of the first doctoral oral examination or subsequent to it; consult with the student throughout the progress of the research; and participate in the final oral examination.

Doctoral committees and students are encouraged to include scholars from outside the program to serve as members of doctoral committees. The outside members may be selected from faculty from other departments of the University, or other institutions where scholarly work is conducted.

Each doctoral student is expected to consult with members of the dissertation committee at frequent intervals throughout the progress of his or her research and submit a progress report to each member of the committee at least once a year.

4. **Examinations:** When students have completed their course work or are in the final stage of their course programs and have satisfied other conditions for admission to candidacy, they are eligible to take the comprehensive doctoral examination. This consists of an oral and a written examination, both conducted by a committee which may or may not be the same as the dissertation committee. The interval between the two examinations should be short. The examinations are taken in the order determined by the committee and should cover all work in the student's major and minor fields of study. In addition to testing the student's knowledge, they may at the time of the oral examination determine the appropriateness and feasibility of the dissertation topic or hold additional examinations for this purpose at a later date.

The oral examination to examine and approve the dissertation prospectus must be conducted by at least five members of the dissertation committee, at least three of whom shall be full members of the Graduate Faculty.

If the student fails either examination he or she may not take the examination a second time until at least three months have elapsed. A

student who fails either examination twice becomes ineligible to continue graduate study.

5. **Admission to Candidacy:** Prior to admission to candidacy, students must have:
  - a. Completed the 18 semester hours of course work required for the doctoral program as described above;
  - b. Passed both oral and written parts of the comprehensive examination; and
  - c. Acquired the MPH; or satisfied the School's MPH core course requirements which applied either at time of admission to the program or at the time of admission to candidacy. If students seek exemptions for any course requirements for the MPH on the grounds of equivalency of other courses taken, equivalency will be determined by the departments in the School which teach those particular courses.
6. **Research:** Each candidate is required to submit a dissertation reflecting research of such scope, originality and skill in presentation as to indicate that the student has a command of the subject and has demonstrated an ability to contribute fresh knowledge or perspectives on the subject. In addition, the dissertation should demonstrate mastery of the research methodology of the discipline.
7. **Application for Degree:** When candidates approach completion of their research and can anticipate final approval of their dissertations they should apply for a degree on a particular graduation date. In the event that the degree is not received in that graduation, the student must file a new Application for Degree. Applications must be filed about three months before the time scheduled for the candidate's graduation in accordance with the deadline given in the calendar of events in this catalog



8. **Final Oral Examination:** The final oral examination should be primarily a defense of the dissertation and be conducted by the appointed dissertation committee. The examination should be open to the public.

This examination shall be held only after all members of the dissertation committee have had adequate opportunity to review a draft of the dissertation which the candidate is prepared to submit for final typing. The dissertation adviser is responsible to the members of the committee for determining that the draft is an appropriate form for their evaluation. The committee may, at the time of the final oral, require alterations and corrections. The dissertation adviser is also responsible for verifying that the changes required by the committee have been made, but may delegate this responsibility to those committee members who imposed the requirements. When these requirements have been met, the Report of the Final Oral Examination is submitted to the Graduate School, and the dissertation in final typed form, designed to meet the standards as defined in *A Guide to the Preparation of Theses and Dissertations*, is registered with the Graduate School.

9. **Time Limitation:** All requirements for the degree must be completed within eight years of the time the student matriculated as a graduate student at this institution. If a student left the University at the completion of a master's program and returned later for the DrPH, he or she would be permitted eight years after admission as a doctoral student for completion of requirements. If the program is interrupted, the student has the option of satisfying the requirements which were in effect either at the time of matriculation or during the final year of work.
10. **Leave of Absence:** A doctoral student may request and receive a leave of absence from graduate study for a definite stated time. Written requests are to be presented through the School's Associate Dean for Graduate Programs to the Graduate School explaining the reasons for the leave. The request must be accompanied by a written approval from the department chairman or director of the doctoral program and endorsed by the Associate Dean for Graduate Programs. If the Graduate School approves the leave of absence, the time of that leave will not count against total time allowed for the degree.

## Doctor of Philosophy

The Doctor of Philosophy degree prepares persons for leadership in academic and related settings involving teaching and research with emphasis on basic or theoretical issues. Graduates are typically employed by universities or other organizations conducting research.

This degree is offered in the Departments of Biostatistics, Environmental Sciences and Engineering, Epidemiology, Health Education, Health Policy and Administration and Parasitology and Laboratory Practice. For details consult each departmental section in this catalog and the Graduate School Catalog.

The precursor to the PhD degree is typically the MSPH degree if the re-

search is oriented to public health or the MS degree if the research is not so oriented.

## Joint Degree Programs

The School of Public Health offers joint degree programs in conjunction with the Schools of Medicine and Dentistry. Under the joint degree arrangement, a student is able to earn two professional degrees in a period of time less than the total required by the two degrees separately. Information on joint degree programs is available upon request from the Associate Dean for Graduate Programs.

## Grades

Grades used in the evaluation of the performance of graduate students are as follows:

<b>H</b>	Clear Excellence
<b>P</b>	Entirely Satisfactory
<b>L</b>	Low Passing
<b>F</b>	Failed

No work falling below the standard represented by the grade **L** is counted for graduate credit. If, in the judgment of the Administrative Board, the quality of work of any student falls below the standard expected of graduate students, the registration of such student will be cancelled. A doctoral student becomes academically ineligible to continue in the Graduate School if he or she receives any grade of **F** or receives 9 or more hours of **L**.

A master's degree student is rendered ineligible to continue if he or she receives more than 0 hours of **F** or receives seven hours or more of **L** if **L** hours are greater than 25% of hours taken. The computation of hours taken will include only courses for which the student has received a grade of **H**, **P**, **L** or **F**. Further, it may include 3 hours of **S** in course 393 (the first 3 hours taken) and courses taken through inter-institutional registration where other permanent letter grades may be assigned.

If a student either completes or withdraws from one graduate program and begins study in another graduate program, those courses to be credited toward the new program will form the basis for academic eligibility.

Additional information on academic regulations are published in the Graduate School Catalog which can be obtained from the Graduate School Office, Bynum Hall, 008A.

## Delta Omega

Election to the Theta Chapter of Delta Omega, public health's national honor society, occurs shortly before graduation and is based upon academic achievement and leadership potential.

## Sigma Theta Tau

Election to the Alpha Alpha Chapter of Sigma Theta Tau (national honor society of nursing) occurs shortly before graduation for nurse students in the School of Public Health.

## Financial Assistance

### Minority Presence Grant Program

Under the Board of Governors general Minority Presence Grant Program black students may be eligible for special financial assistance if they are residents of North Carolina, enrolled for two or more courses in a degree program, and demonstrate financial need.

The Minority Presence Grant Program for Doctoral Study, Law, and Veterinary Medicine provides stipends of up to \$4,000 for the academic year, with an option of \$500 in additional support for study in the summer session, for black residents of North Carolina who are selected to participate. Recipients must be full-time students pursuing doctoral degrees, law degrees, or degrees in veterinary medicine at East Carolina University, North Carolina State University at Raleigh, The University of North Carolina at Chapel Hill, and The University of North Carolina at Greensboro.

### Traineeships, Assistantships, & Loans

Federally sponsored "non-service" traineeships and fellowships are available to properly qualified candidates. Traineeships or fellowships will not be awarded until the student has been admitted to the School. A few graduate assistantships are "service" appointments and usually require a reduced load of academic work. Persons desiring consideration for service or non-service awards should so indicate by checking the appropriate box on the application or admission form.

Other work opportunities and some student loan funds are available from the University Student Aid Office. Application should be made to, Director, Office of Student Aid, 300 Vance Building, 057A, Chapel Hill, N.C. 27514-6201.

### Scholarships

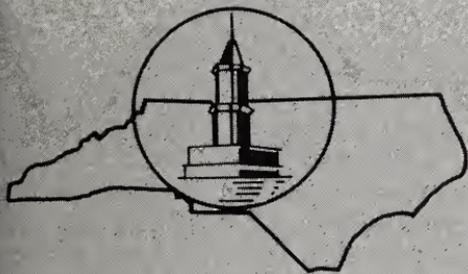
Professor Ruth Warwick Hay, the first Head of the Department of Public Health Nursing, left a part of her estate in trust for a scholarship which she wished to be known as the *Margaret Blee — Ruth Warwick Hay Scholarship*.

The income from the fund is awarded annually as an honorary scholarship to a student enrolled in the Department of Public Health Nursing. A Scholarship Committee of faculty and students oversees the selection of the candidate who is nominated and elected by the full-time faculty and students. An appropriate occasion is planned each year for awarding the scholarship and recognizing the recipient.



## Student Union

All members of the School of Public Health student body are members of the Student Union. Its offices are made up of departmental representatives and a central Union Board which represents the entire student body. The Assistant Dean for Students serves as a liaison representative. The purposes of the Student Union are: (1) to enhance and ensure the opportunity of the student to receive an education of the highest attainable quality; (2) to represent and advocate causes and interests of the student body; (3) to stimulate interest in and encourage activities which relate to health in its broadest sense and (4) to function as a channel of communication between the student body and the faculty.



## departments

### BIOSTATISTICS

**Chairman**—James E. Grizzle, Professor

**Registrar**—Anne S. Moneyhun—Telephone No. (919) 966-1107

### FACULTY

James R. Abernathy, Professor

Arjun L. Adlakha, Research Associate Professor

Shrikant I. Bangdiwala, Research Assistant Professor

Richard E. Bilsborrow, Research Associate Professor

Lloyd E. Chambless, Visiting Associate Professor

Shelby B. Chi, Research Assistant Professor

Elizabeth J. Coulter, Professor

John P. Creason, Adjunct Assistant Professor

Clarence E. Davis, Associate Professor

David M. DeLong, Adjunct Assistant Professor

Elizabeth R. DeLong, Adjunct Assistant Professor

Regina C. Elandt-Johnson, Professor

Robert C. Elston, Adjunct Professor

Edward L. Frome, Adjunct Assistant Professor

Dennis B. Gillings, Professor

Bernard G. Greenberg, Kenan Professor

Sandra B. Greene, Adjunct Assistant Professor

Roger C. Grimson, Associate Professor

Priscilla A. Guild, Adjunct Instructor

Frank E. Harrell, Jr., Adjunct Assistant Professor

Ronald W. Helms, Associate Professor

David G. Hoel, Adjunct Professor

Daniel G. Horvitz, Adjunct Professor

James D. Hosking, Assistant Professor

Joseph M. Janis, Research Assistant Professor

Norman J. Johnson, Assistant Professor

William D. Kalsbeek, Assistant Professor  
John M. Karon, Research Associate Professor  
David G. Kleinbaum, Associate Professor  
James D. Knoke, Associate Professor  
Gary G. Koch, Professor  
Roy R. Kuebler, Jr., Professor Emeritus  
Lawrence L. Kupper, Professor  
Charles H. Langley, Adjunct Assistant Professor  
Kerry L. Lee, Adjunct Associate Professor  
Judith T. Lessler, Adjunct Assistant Professor  
Forest E. Linder, Professor Emeritus  
Anders S. Lunde, Adjunct Professor  
Donna K. McClish, Research Assistant Professor  
Keith Muller, Research Assistant Professor  
Lawrence E. Myers, Adjunct Assistant Professor  
Kadambari Nambodiri, Research Associate Professor  
William C. Nelson, Adjunct Associate Professor  
M. Nizamuddin, Research Assistant Professor  
Karl E. Peace, Adjunct Assistant Professor  
Dana Quade, Professor  
Donald W. Reinfurt, Adjunct Associate Professor  
Wilson B. Riggan, Adjunct Associate Professor  
Charles J. Rothwell, Adjunct Instructor  
Warren H. Schonfeld, Adjunct Assistant Professor  
Pranab K. Sen, Professor  
Richard H. Shachtman, Professor  
Babubhai V. Shah, Adjunct Professor  
Chirayath M. Suchindran, Associate Professor  
Jeremiah M. Sullivan, Research Associate Professor  
Michael J. Symons, Professor  
Craig D. Turnbull, Associate Professor  
James H. Ware, Adjunct Associate Professor  
H. Bradley Wells, Professor Emeritus  
William E. Wilkinson, Adjunct Associate Professor  
O. Dale Williams, Professor  
Oleh Wolowyna, Research Assistant Professor  
David L. Zalkind, Adjunct Associate Professor

The Department of Biostatistics offers programs of study leading to an undergraduate degree (Bachelor of Science in Public Health) three master's degrees (Master of Public Health, Master of Science in Public Health, and Master of Science), and two doctoral degrees (Doctor of Philosophy and Doctor of Public Health).

The Bachelor of Science in Public Health (BSPH) program seeks to train students for entry-level statistical positions in health and related organizations, as well as for a sequence of career development opportunities including subsequent experience and graduate training. Information about admission and course requirements for this degree is available on page 22 of this catalog and in the Undergraduate Bulletin of the University.

The Master of Public Health (MPH) degree program is designed to prepare individuals for positions in federal, state, and local agencies that require knowledge of the broad field of public health as well as specialized knowledge of biostatistics. The Master of Science in Public Health (MSPH) degree program is more theoretical in content than the MPH program and is designed to prepare the student for a more specialized field of public health statistics. The Master of Science (MS) degree is intended to provide research-oriented training in theory and methodology.

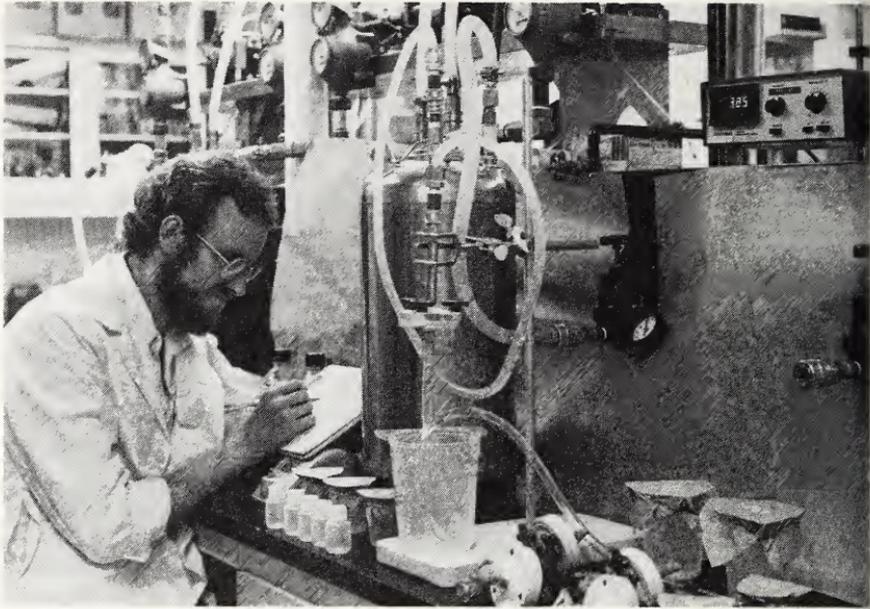
The Doctor of Philosophy (PhD) degree program is designed to provide advanced, research-oriented training in theory and methodology to prepare individuals especially for academic careers and research positions in the government or elsewhere. The Doctor of Public Health (DrPH) degree program emphasizes professional training aimed at preparing students for leadership positions in the general areas of applied research projects related to health problems, and delivery of technical statistical services in the health field. To meet these objectives the program is designed to equip students with a thorough knowledge of the technical aspects of the application of statistical techniques to a range of health problems, and a basic knowledge of an applied area of public health.

Graduate admissions are usually made initially for study toward a master's degree. Time requirements to obtain the degrees, assuming the departmental requirement of integral calculus has been met, are typically 12 months for the MPH, 16 months for the MSPH, two academic years for the MS, and approximately four years for the doctoral degrees.

Biostatisticians apply their quantitative knowledge to a variety of special fields related to the health of the people—such as the physical environment, the size and characteristics of the population, patterns of disease and disability, and health service utilization and costs. In recognition of these different applications, the Department provides for the following specialty options within biostatistics: biometry, cardiovascular diseases, data management, demography and population studies, environmental biostatistics, genetics, health services, mental health statistics and occupational health.

The Department of Biostatistics also participates in training programs through which the students may receive a Master of Arts (MA), Master of Science (MS), or Doctor of Philosophy (PhD) degree with a major in statistics and a minor in public health through the Department of Statistics, The University of North Carolina at Chapel Hill or a Master of Statistics (MStat), Master of Sciences (MS), or doctorate (PhD) with a major in statistics and a minor in public health through the Department of Statistics at North Carolina State University in Raleigh.

Further information about the Biostatistics training programs is available in brochures which can be obtained by writing to the Department of Biostatistics, School of Public Health, 201-H, The University of North Carolina at Chapel Hill, Chapel Hill, North Carolina 27514-6201.



## ENVIRONMENTAL SCIENCES AND ENGINEERING

**Chairman**—Russell F. Christman, Professor

**Registrar**—Jan McCormick — Telephone No. (919) 966-1171

The Department of Environmental Sciences and Engineering offers five academic programs: Air and Industrial Hygiene, Environmental Chemistry and Biology, Environmental Management and Protection, Radiological Hygiene and Water Resources Engineering. The reader is directed to the differences in program area content, research interests, and career opportunities. Descriptions of each area follow this introduction.

The Master of Science, Master of Science in Public Health and Master of Public Health degrees are offered in each area. The general University and School of Public Health requirements for these degrees are listed on page 27-29. A bachelor's degree with a major in engineering or science, usually chemistry, biology, or physics, is a requirement for admission. Applicant should have successfully completed a minimum of 40 semester hours of science or engineering including courses in physics, chemistry, biology, and calculus. The Master of Science in Environmental Engineering degree is offered by the programs in Air and Industrial Hygiene and Water Resources Engineering. See page 29 for admission and degree requirements. Candidate for this degree must hold an engineering degree from an institution accredited by the Accreditation Board for Engineering and Technology or an equivalent foreign institution. Backgrounds in civil, environmental, sanitary, chemical or mechanical engineering, where the curriculum has involved funda

mental work in chemistry, physics, mathematics, and the engineering sciences, are preferred. One and two year programs are offered in each area.

The Doctor of Philosophy is offered in each of the programs. In general, applicants without master's degrees are required to pursue the PhD via a master's degree. Direct admission to the PhD program may be possible for the exceptional student. Students holding master's degrees from other institutions may be required to enroll for a second master's degree in this department prior to initiating doctoral work. This requirement is dependent upon a review of the individual student's background by the faculty. Four semesters of full-time graduate study, at least two of which must be earned in continuous registration on this campus, are necessary. Based upon past experience actual residence time may be considered a minimum of two years following a master's degree, with a median of three and one-half years.

Other requirements include a major in one of the program areas and a supporting program or minor of at least 15, but preferably 21, semester hours excluding seminar and research units selected to be of maximum benefit in the conduct of the research and preparation of the dissertation. The Department and the University require knowledge of a research skill or foreign language for the PhD degree. Doctoral written and oral examinations are customarily given upon completion of course work and prior to initiating research for the dissertation. The defense of the dissertation is the final oral examination for the doctorate. Programs leading to the PhD are too varied to permit illustration.

Interdisciplinary studies are encouraged and coordinated by organizations within the University, such as the Institute for Environmental Studies, the Water Resources Research Institute, and the Institute for Marine Sciences. Joint programs of study, such as the program in radiological hygiene offered with North Carolina State University in Raleigh, draw on the specific resources of each area with students developing their major interest depending on their training in basic disciplines.

Courses offered by the Department of Environmental Sciences and Engineering are described on pages 97-106 of this catalog. Courses may be taken at Duke University and at North Carolina State University without payment of additional tuition.

The Department publishes a brochure, "Programs of Graduate Study and Research," and a quarterly "ESE Notes," which are available on request.

## **Air and Industrial Hygiene**

Parker C. Reist, Professor, Program Area Director

Mahmoud A. Ayoub, Adjunct Professor

Mario C. Battigelli, Professor

Warren A. Cook, Adjunct Professor

John M. Dement, Adjunct Associate Professor

Donald L. Fox, Associate Professor

David A. Fraser, Professor

Leonard J. Goldwater, Adjunct Professor

Robert L. Harris, Professor

John L.S. Hickey, Research Associate Professor  
Harvey E. Jeffries, Associate Professor  
John C. Lumsden, Adjunct Professor  
Madhav B. Ranade, Adjunct Associate Professor  
Hugo H. Rogers, Adjunct Associate Professor  
Carl M. Shy, Professor  
Herschel Slater, Adjunct Associate Professor  
Arthur C. Stern, Professor Emeritus  
William E. Wilson Adjunct Associate Professor

This program is designed to provide graduate instruction for students interested in pursuing careers dealing with air pollution or industrial hygiene.

The air pollution specialist program and industrial hygiene program have slightly different emphases. Industrial hygiene is that science and art devoted to the recognition, evaluation and control of environmental factors or stresses arising in or from the work-place which may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers or among citizens of the community. Air pollution control, on the other hand, is concerned more with the general problems of pollutants in the atmosphere their sources, sinks, transformation, transport and eventual effect on humans, plants and animals. Both the fields of air pollution control and industrial hygiene represent areas of preventive public health where the professional uses his knowledge to weigh the cost of control against the long term public cost of inaction, and to develop effective methods of lowering control costs.

Barring exceptional circumstances, all students in the program area would be expected to study **Biostatistics**, (BIOS 105 or 135); **Epidemiology in Environmental Health** (EPID 162), and **Applied Physiology and Toxicology** (ENVF 143). In addition, each student should have a basic course in **Air and Its Contaminants** (ENVR 243) and **Industrial Hygiene Practices** (ENVR 242).

For students primarily interested in Industrial Hygiene a course in **Industrial Hygiene Engineering Control Design** (ENVR 146) and **Industrial Hygiene Laboratory** (ENVR 244) would normally be required. Courses in **Aerosol Science** (ENVR 241), **Occupational Safety** (ENVR 147) and **Industrial Medicine** (ENVF 248) are recommended as electives.

For persons interested in air pollution, **Air Pollution Measuring Monitoring and Survey** (ENVR 144), **Air Pollution Control** (ENVR 245), and a course in meteorology, **Air Pollution Meteorology** (ENVR 249) would be required. Other suggested courses would be **Aerosol Science** (ENVR 241), **Instrumentation and Data Acquisition** (ENVR 145), **Biological Effects of Air Pollution** (ENVF 246) and **Chemistry of the Troposphere** (ENVR 247).

Students select elective courses covering such diverse topics as **Radiation Protection** (ENVR 161, ENVR 263), **Environmental Management** (ENVR 211, ENVR 212, ENVR 276), **Natural Resource Law and Policy** (ENVR 283), or **Instrumental Methods of Analysis** (ENVR 221). Other more specialized programs of study are possible and can be arranged between the individual student and adviser.

## Environmental Chemistry and Biology

Edward J. Kuenzler, Professor, Program Area Director  
 Philip W. Albro, Adjunct Associate Professor  
 Russell F. Christman, Professor  
 Donald E. Francisco, Lecturer  
 James R. Hass, Adjunct Associate Professor  
 J. Donald Johnson, Professor  
 David S. Millington, Research Associate Professor  
 Frederic K. Pfaender, Associate Professor  
 Mark S. Shuman, Professor  
 Mark D. Sobsey, Associate Professor  
 Charles M. Weiss, Professor

This program prepares students with backgrounds in chemistry and biology for careers in the sciences of water resources, ecology, and pollution control. Course work and research opportunities are offered in aquatic biology; microbial ecology; microbiology; virology; limnology; health effects agents; analytical, organic and physical chemistry; and the chemistry and biology of water and wastewater treatment processes.

Master's degree graduates from this program area are employed with local, national and international agencies and government, consulting engineers, and industry. They serve as environmental managers, directors of field and laboratory research projects and as members of teams in water resources management and process development. PhD graduates join the faculties of colleges and universities in public health and environmental programs, and are employed as environmental managers and directors of major environmental research programs in local, national and international agencies, government and industry.

Two years are usually required for completion of a master's degree in this program depending upon the interests and ability of the student as well as the type of financial support available. The average master's student spends a third of his time in the completion of a research project and technical report or thesis. These projects are usually part of larger grant-funded projects of the faculty, and provide the student with financial support as a research assistant. Traineeships, fellowships and teaching assistantships are also available.

Course work concentrates in either the major of environmental chemistry or biology. Courses are also selected from other program areas and departments in the School, from many departments of the University and from nearby universities. Among these electives are courses ranging from environmental law and planning to physical chemistry and physiology.

Students pursuing environmental chemistry must take two courses in biology and three courses in chemistry. Students electing environmental biology take one chemistry course as well as four biology courses. In addition, one course each in epidemiology, biostatistics, engineering unit processes, and an elective environmental science course are required for both specializations.

Courses commonly selected to satisfy the above requirements are: **Chemistry**—ENVR 122, ENVR 123, ENVR 128, ENVR 221, ENVR 222, ENVR 223, CHEM 160; **Biology**—ENVR 131, ENVR 132, ENVR 133, ENVR 134, ENVR 135, ENVR 138, ENVR 236, BIOC 100; ENVR 137, ENVR 231, ENVR 232, ENVR 233, ENVR 235, ZOO 226; **Engineering Unit Processes**—ENVR 174, ENVR 274, ENVR 275; **Epidemiology**—EPID 160, EPID 162; **Biostatistics**—BIOS 105, BIOS 135, BIOS 145; **Other Environmental Science Electives**—ENVR 141, ENVR 143, ENVR 161, ENVR 171, ENVR 283; **Research**—ENVR 320, ENVR 330, ENVR 392.

## **Environmental Management and Protection**

Alvis G. Turner, Associate Professor, Program Area Director

Richard N.L. Andrews, Professor and Director, Institute Environmental Sciences

Linda S. Birnbaum, Adjunct Assistant Professor

Emil T. Chanlett, Professor Emeritus

Russell F. Christman, Professor

Avram Gold, Assistant Professor

Warren T. Piver, Adjunct Associate Professor

Morris A. Shiffman, Professor

Graduate studies in this program area offer a multi-disciplinary approach to understanding and developing strategies for protecting human health and environmental quality. Course work and research opportunities are offered in Environmental Management and Environmental Toxicology.

The policy analysis and management curriculum prepares graduates with a basic understanding of and the ability to use scientific and technical data, decision-making theory, management methods, environmental law, economic approaches and risk assessment in the development and implementation of public policy decisions, environmental standards and protection programs. Students choosing this option are prepared to appreciate the relationship between environmental issues and the human behavior and institutional contexts in which they are managed. Technical and analytical skills in planning and evaluating environmental policy and program options are emphasized.

The toxicology curriculum offers students a basic preparation in biochemistry, molecular biology, dose-response theory, epidemiological methods and the techniques for human exposure evaluation and risk assessment. Students choosing this option are prepared to identify and evaluate the injurious effects of chemicals in the environment, to suggest management strategies for controlling toxic substances and hazardous wastes, and to participate in toxicological research. The identification, distribution and dispersion of hazardous agents in the environment, the metabolism of toxic compounds and quantitative risk assessment are emphasized.

Students in the policy and management option are expected to plan their courses and research to focus on environmental policy, management, law, economics, regulatory decision-making and human behavior with sufficient

technical preparation to appreciate the biologic and chemical processes which occur in the environment. Students in the toxicology option are expected to focus their studies and research in applied toxicology, biochemistry, human physiology and epidemiology with sufficient policy and management preparation to demonstrate an appreciation of the policy issues and management strategies which can be used to protect human health and environmental quality.

Eighteen to twenty-four months are usually required for completion of a master's degree. At least one-third of this time is spent on the research and preparation of a technical report or thesis. Study and research for the Ph.D. degree usually takes three years beyond the master's degree.

Graduates of this program are often employed by regulatory agencies, consulting firms, public interest groups, industry and research organizations.

## Radiological Hygiene

James E. Watson, Associate Professor, Program Area Director

Edward L. Chaney, Adjunct Associate Professor

Richard E. Johnston, Associate Professor

Paul S. Stansbury, Assistant Professor

Arthur W. Waltner, Professor

David B. Washburn, Adjunct Assistant Professor

Donald G. Willhoit, Associate Professor

The objective of the program in radiological hygiene is to provide competent, professional personnel to meet the increasing demand for health physicists and medical physicists.

Health physics is a profession devoted to the protection of man and his environment from unwarranted radiation exposure. A health physicist is a person engaged in the study and application of radiation protection. Based on a knowledge of the mechanism of radiation damage and radiation protection standards, he develops and implements methods and procedures necessary to evaluate and protect man and his environment from unwarranted radiation exposure.

Primarily an applied branch of physics, medical physics is a closely allied scientific discipline. The medical physicist applies concepts, methods, and forces of physics to the diagnosis and treatment of human disease. Several distinct professional areas have emerged for the medical physicist. These include the application of sources of radiation to medical diagnosis, therapy and research.

Students enrolled in either health physics or medical physics take a common core of courses. Course electives and research or special project topics are selected based upon whether the student specializes in health physics or medical physics. Over the past decade, this program has produced approximately 5% of this nation's total graduates with advanced degrees in radiological hygiene. Employment opportunities exist in industries, hospitals, universities, state agencies and federal agencies, such as the Bureau of Radiological Health, Department of Energy, Environmental Protection Agency, and the Nuclear Regulatory Commission.

The radiological hygiene program has been conducted since 1961 and offers graduate training leading to master's and doctoral degrees. It is a joint effort between the Department of Environmental Sciences and Engineering and the Departments of Nuclear Engineering and Physics at the North Carolina State University at Raleigh. Students may enter the program through either branch of the University. This joint effort expands opportunities for health physics training related to the nuclear power industry. Individual study of projects in medical physics may be pursued in a joint effort with the Department of Radiology, School of Medicine. Three medical physicists in the Department of Radiology hold joint appointments in this department.

Students with degrees in physics, nuclear engineering, biology or chemistry are admissible to graduate programs in radiological hygiene. The course ENVR 162, **Modern Physics for Environmental Science**, provides training in atomic and nuclear physics applicable to radiological hygiene for students without prior training in this area. Basic college physics is required.

In addition to the biostatistics and the epidemiology courses required by the School, the courses which constitute a core within this program are: ENVR 163, **Radiation Instrumentation**; ENVR 261, **Radiation Biophysics**; ENVR 263 **Radiation Hazards Evaluation** and GN 532 (NCSU), **Biological Effects of Radiation**. A student is not required to take a core course if he has had equivalent academic instruction in prior work. The student's faculty adviser in consultation with the program director makes the determination for core course exceptions. Students may elect additional courses from within the Department of Environmental Sciences and Engineering and from other departments at this University as well as from North Carolina State University.

If course work and research for the required technical paper are undertaken concurrently, a master's degree can be completed in one year. The average time required to complete a master's degree is one and one-half years. A two year program allows the student to carry out a more intensive research project and to take additional elective courses.

## Water Resources Engineering

Philip C. Singer, Professor, Program Area Director

John Briscoe, Visiting Assistant Professor

Francis A. DiGiano, Professor

Neil S. Grigg, Adjunct Professor

Milton S. Heath, Professor

David H. Howells, Professor Emeritus

Maynard M. Hufschmidt, Professor Emeritus

James C. Lamb, Professor

Donald T. Lauria, Professor

Forest O. Mixon, Adjunct Professor

David H. Moreau, Professor

Daniel A. Okun, Kenan Professor

Charles R. O'Melia, Adjunct Professor

<sup>1</sup>Jabbar K. Sherwani, Associate Professor

<sup>1</sup>Died, August 22, 1981

The Water Resources Engineering program is designed to prepare graduates to enter positions in several different areas of water resources engineering, as contrasted with training to fill a few specialized types of jobs within the profession. Its overall goal is development of technical skills, social awareness and professional attitudes necessary for efficient entry and growth in water resources engineering careers. Upon completion of the program the graduate should be qualified to participate in investigating, planning, designing, constructing, operating and regulating water resources systems and programs in service of man. Past Water Resources Engineering graduates have joined many types of agencies and organizations, including the federal government, state regulatory agencies, consulting firms, many types of industries, the military services, and research organizations.

The Water Resources Engineering program offers the Master of Science in Environmental Engineering degree. The Master of Science in Environmental Engineering degree is accredited by the Accreditation Board for Engineering and Technology for advanced training of students with bachelor's degrees in engineering from accredited undergraduate programs.

The curriculum is developed to meet specific needs and interests of each candidate within the framework of flexible overall requirements for exposure to content areas judged by the faculty to be basic necessities for the degree. This is accomplished by taking a minimum of two courses in environmental sciences, two in planning-design, and one course in each of the other groups indicated:

**Environmental Sciences**—ENVR 122, 131, 133, 134, 217, 218, 224, 281; **Bio-statistics**—BIOS 105, 135, 145, 150, 151; **Planning-Design**—ENVR 176, 272, 273, 277, 278, 282, 283, 284; **Water Quality Management**—ENVR 132, 174, 274L, 271, 274, 275, 276; **Master's Problem**—ENVR 370, ENVR 392.

This arrangement provides great latitude for the student and faculty adviser to plan a coherent program meeting needs of the individual candidate.

The candidate's program may be directed toward (1) technical aspects of water supply and treatment, wastewater collection, treatment and disposal; and the control of water pollution, or (2) the planning, engineering, economic, and administrative aspects of water resources development and management, or (3) a combination of these. The minimum length of program is 12 months, although many students remain in residence for an extra semester or two to avail themselves of additional flexibility in course selection and independent study.

Other degrees available at the master's level in water resources engineering include the MS, MSPH and MPH. These permit advanced training of interdisciplinary professionals for participation in water resources planning activities and allow more flexibility for engineers wishing to prepare for practice across broad aspects of the field. Occasionally, engineers employed by health agencies are encouraged or required by them to obtain MPH or MSPH degrees, often in preparation for administrative posts. These candidates may require less emphasis on design or other technological aspects and more on administration of water resources or community health programs. Science or engineering students interested in the interdisciplinary aspects of water resources planning may wish to prepare for careers based on operations research, sys-

tems analysis, resource economics and other areas not directly related to the design, construction or operation of water resources systems.

The PhD degree with a major in water resources engineering provides the student with more in-depth knowledge through further course work in water resources engineering, a minor or other program of study supporting the chosen area of research, and an intensive period of research. The goal is to develop understanding beyond that acquired at the master's level of current problems in the field, including techniques for their identification, evaluation and solution. The candidate must master methods for acquiring knowledge from various fields required to solve future problems, techniques for applying that knowledge to synthesize new solutions for new water resources problems, and communication of investigational results to others through oral and written presentations.

Many of our PhD graduates have contributed greatly to the profession by becoming productive academicians and training future generations of water resources engineers. Others make major contributions through developing new knowledge as members of research organizations and academic institutions. Many engage in full or part-time consulting, using their advanced knowledge to assist in solving current problems and planning to meet future needs.



# EPIDEMIOLOGY

**Chairman**—Michel A. Ibrahim, Professor

**Registrar**—Joyce Allen—Telephone No. (919) 966-5731

## FACULTY

Dragana A. Andjelkovich, Adjunct Associate Professor  
Caroline Becker, Associate Professor  
Steven R. Blum, Adjunct Assistant Professor  
Harvey Checkoway, Research Assistant Professor  
Joan Cornoni-Huntley, Adjunct Associate Professor  
Lawrence M. Cutchin, Clinical Associate Professor  
Gordon H. DeFriese, Clinical Associate Professor  
Robert H. Fletcher, Clinical Associate Professor  
Suzanne W. Fletcher, Clinical Associate Professor  
H. Hugh Fudenberg, Adjunct Professor  
John T. Fulton, Professor Emeritus  
Stephen H. Gehlbach, Adjunct Assistant Professor  
Kathrine M. Habib, Adjunct Assistant Professor  
Curtis G. Hames, Clinical Professor  
Carl G. Hayes, Adjunct Associate Professor  
Suzanne G. Haynes, Research Assistant Professor  
Gerardo Heiss, Research Associate Professor  
Siegfried H. Heyden, Adjunct Professor  
John Higginson, Research Professor  
Michael D. Hogan, Adjunct Assistant Professor  
Barbara S. Hulka, Professor  
Sherman A. James, Associate Professor  
Berton H. Kaplan, Professor  
David G. Kleinbaum, Associate Professor (Biostatistics)  
Gory J. Love, Research Associate Professor  
Clarence C. Lushbaugh, Adjunct Professor  
J. Newton MacCormack, Adjunct Associate Professor  
Eugene S. Mayer, Adjunct Associate Professors  
Melinda S. Meade, Adjunct Associate Professor  
J. Michael Moser, Adjunct Assistant Professor  
Abdel R. Omran, Professor  
George R. Parkerson, Adjunct Assistant Professor  
Ralph C. Patrick, Associate Professor  
Samuel M. Putnam, Adjunct Assistant Professor  
Walter J. Rogan, Adjunct Assistant Professor  
Seth A. Rudnick, (Medicine) Assistant Professor  
Victor J. Schoenbach, Research Assistant Professor  
Cecil G. Sheps, Professor  
Carl M. Shy, Professor  
David S. Siscovik, Clinical Assistant Professor

<sup>1</sup>Cecil Slome, Professor

Allen H. Smith, Adjunct Associate Professor

Michael R. Swift, Clinical Professor

Herman A. Tyroler, Alumni Distinguished Professor

Edward H. Wagner, Associate Professor (Medicine)

Allen J. Wilcox, Adjunct Assistant Professor

Carolyn A. Williams, Associate Professor

The Department of Epidemiology offers research training in six specialized areas: cancer, cardiovascular diseases, environment, health service/clinical epidemiology, population/family planning, and psychosocial factors. The study program includes courses, seminars, and tutorials designed to help the student achieve research and teaching skills in epidemiology.

Students wishing to enroll in the program should have demonstrated competence in either the biomedical, behavioral, or quantitative sciences.

The degrees offered by the Department are Master of Public Health, Master of Science in Public Health, Doctor of Public Health, and Doctor of Philosophy. The MPH degree program is a course of study designed for persons with terminal professional degrees in the biomedical or the behavioral sciences. Students are trained for professional public health practice or for teaching positions, usually in schools of medicine. Thirty semester hours of credit are required for this degree, including the School core courses as stated on page 25. Beyond this core, the faculty adviser and the student design a curriculum to meet the needs of the individual student.

Designed primarily but not exclusively for persons without terminal professional degrees who wish to continue working toward a PhD degree, the two-year MSPH program prepares students for mid-level research positions in health or research agencies. Within the minimum of thirty semester hours of credit all students must take basic courses in biostatistics, epidemiology and environmental science. The remainder of the curriculum is designed with the faculty adviser to meet the needs of the individual student.

All MPH and MSPH candidates must complete a final written examination and a major paper, and present their research for the major paper on a scheduled Master's Presentation Day.

Students in programs leading to the Doctor of Public Health or the Doctor of Philosophy degree must satisfy the Graduate School residency requirements as specified in the Graduate School Handbook and pages 30-32 in this catalog and demonstrate ability to use the computer. At least three semester hours of credit must be for the dissertation course, EPID 394. Beyond these requirements, each student's program is planned individually.

At a suitable time during the student's residency a qualifying examination is given, covering biological, social and quantitative areas. Until the qualifying examination has been successfully completed, the admission is considered provisional.

A doctoral student must complete both a written and an oral examination, and submit and defend a dissertation which entails the collection and analysis of original data. The research problem must be original and demonstrate a highly sophisticated level of skill.

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<sup>1</sup>Died, July 23, 1981

The Department of Epidemiology maintains strong relationships with other departments and schools of the University. Since the program of study is designed around the unique interests of the individual student and the requirements of the research proposal, students are encouraged to utilize the resources of the University. Students may take courses in the Departments of Biostatistics, Environmental Sciences and Engineering, Health Policy and Administration, Nutrition and other departments within the School of Public Health. Relevant courses in the Schools of Medicine, Dentistry, Nursing, and Pharmacy and the Departments of Sociology, Psychology, and Anthropology are also available.

The faculty of the Department of Epidemiology believes strongly in the apprenticeship mode of learning. Students in Epidemiology are **not** expected to attend a specific number or type of courses but, in addition to completing the courses and credit hours required by the School, are expected to achieve a set of skills and competencies which would enable them to function comfortably in the field.

## HEALTH EDUCATION

**Chairman**—Guy W. Stuart, Professor

**Registrar**—Linda Cook—Telephone No. (919) 966-3761

### FACULTY

John Allen, Adjunct Instructor

Miriam Bachar, Adjunct Assistant Professor

Howard Barnhill, Clinical Associate Professor

Harriet H. Barr, Clinical Assistant Professor

Ralph H. Boatman, Jr., Professor

Darryll Candy, Clinical Assistant Professor

Eva Clayton, Adjunct Assistant Professor

Donald R. Dancy, Adjunct Assistant Professor

Ann Daniels, Adjunct Instructor

Michael Davies, Clinical Assistant Professor

Leonard H. Dawson, Clinical Assistant Professor

Brenda DeVellis, Assistant Professor

Robert DeVellis, Adjunct Assistant Professor

Jo Anne Earp, Associate Professor

Eugenia Eng, Instructor

John W. Hatch, Associate Professor

Godfrey M. Hochbaum, Professor

Richard House, Clinical Assistant Professor

Raymond B. Isley, Adjunct Assistant Professor

Rosemary May Kent, Associate Professor Emerita

Joyce Kramer, Assistant Professor

John C. Key, Adjunct Assistant Professor

Nancy McCharen, Clinical Assistant Professor

<sup>1</sup>Effective September 1, 1982

Lucille F. Minuto, Adjunct Instructor  
Lucy S. Morgan, Professor Emerita  
Horace G. Ogden, Adjunct Professor  
Marcia Ory, Adjunct Assistant Professor  
Margaret Pollard, Clinical Assistant Professor  
LaVerne Reid, Adjunct Instructor  
Nadine Rund, Adjunct Associate Professor  
Preston Schiller, Assistant Professor  
Allan Steckler, Associate Professor  
Frank Stritter, Associate Professor  
Rosalind Thomas, Clinical Assistant Professor  
Helen L. Tinnin, Adjunct Associate Professor  
Eunice Tyler, Professor Emerita  
Tony L. Whitehead, Assistant Professor

The Department of Health Education is concerned with the general field of health-related social and behavioral change ranging from the levels of social policy to those of community, family and individual. It has a particular interest in sub-cultural, minority and cross-cultural settings and in rural health.

The Department offers four graduate degree programs and an undergraduate major in health education in the BSPH degree program. General information and details about admission and the undergraduate curriculum are found on page 22 of this catalog and in *The Undergraduate Bulletin*. Students in the program are prepared for beginning level positions in health education in health and other community agencies and for graduate study in health education.

The Master of Public Health degree is the basic qualification for the professional health education specialist. The program of study prepares candidates for professional roles in community and social policy action and development and in educational programs of health and allied agencies both domestic and international. In general, students are prepared for professional positions at the community practice or administrative level in organizations or agencies which require applied knowledge and expertise of health-related behavioral, social and political change.

The general requirements for admission are set forth on pages 24-25. The previous bachelor's degree should include a minimum of four courses in psychology, sociology, anthropology and/or political science, at least one of these to be an advanced course. The candidate should have a minimum GPA of 3.0 for courses in the above areas.

The minimum period of study is four-semester and two summer sessions in continuous full-time residence, admission being mainly in the fall of each academic year.

All students are required to have field work experience in a selected community which is continuous throughout the program and to select a subspecialty area (e.g. population, social policy, the family, mental health, rural health, women's health, etc.)

A more specialized degree than the MPH, the Master of Science in Public Health emphasizes evaluation and research. It may be a terminal degree, but commonly will be a prelude to the Doctor of Philosophy program. As a terminal degree it prepares candidates for specialized roles (e.g. mass media, group dynamics, training) in community health education and development programs. It is not the equivalent of the generalist practice degree (MPH), but is an individualized program of study in a specialized area of health education.

The general requirements for admission are set forth on pages 27-28. The usual requirement is a prior bachelor's major in the social sciences, but certain exceptions are acceptable. The minimum period of study is four semesters and two summer sessions in full-time residence.

Within certain general but well-defined constraints, all students are expected to take a major responsibility for their own individual programs of study, research and experience and to take the initiative in maintaining close relationship with their respective faculty advisers.

In admission policy, besides the level and relevance of previous academic achievement, special consideration is given to developing a balanced student body recognizing the obligation to state residents and including a mix of individuals with special life or work experience drawn from the United States and from foreign countries.

The Doctor of Public Health is a professional and research degree which prepares candidates for administrative, consultative and evaluative research roles in community health education and for faculty teaching and research positions in public health and other professional schools.

The prerequisite is possession of the MPH degree or equivalent. Candidates for this program are normally expected to have an outstanding academic record in their prior undergraduate and graduate programs. The minimum period of study is full-time residence of two academic years (four semesters and four summer sessions). In addition to an advanced general knowledge of public health and selected social science foundations, emphasis is placed on evaluative research in field settings.

A basic social science and research degree, the Doctor of Philosophy prepares candidates primarily for teaching and research careers in universities and professional schools and consultative roles relevant to community health education and development.

The prerequisite is normally the MSPH, or a social science masters degree. Candidates are expected to have an outstanding academic record in their prior undergraduate and graduate programs. The minimum period of study is full-time residence of two academic years (four semesters and four summer sessions). Besides advanced knowledge in selected substantive areas of the social sciences, emphasis is placed on basic research relevant to health-related social and behavior change, both planned and unplanned.

## HEALTH POLICY AND ADMINISTRATION

**Chairman**—Sagar C. Jain, Professor, Clinical Professor of Psychiatry  
**Deputy Chairman**—Robert A. Loddengaard, Clinical Associate Professor  
**Registrar**—Carol Mooney, Telephone No. (919) 966-4091

### FACULTY

James Elmore Allen, Associate Professor  
Thomas J. Bacon, Research Assistant Professor  
Patricia Z. Barry, Associate Professor  
William Baxter, Lecturer  
Dan Edward Beauchamp, Associate Professor  
Deborah Bender, Adjunct Assistant Professor  
Marvin J. Block, Adjunct Associate Professor  
B.J. Campbell, Lecturer  
Abraham S. David, Adjunct Professor  
Basil Delta, Lecturer  
James P. Dixon, Clinical Professor  
George G. Dudley, Adjunct Professor  
David W. Dunlop, Adjunct Associate Professor  
J. Wilbert Edgerton, Lecturer  
Laurel A. Files, Assistant Professor  
William Shoemaker Flash, Associate Professor  
Deborah A. Freund, Assistant Professor  
Moye Wicks Freymann, Professor  
Benjamin Gilbert, Clinical Assistant Professor  
Charles Taylor Grubb, Clinical Instructor  
Charles L. Harper, Associate Professor and Associate Dean  
William Theodore Herzog, Associate Professor  
Martin Patterson Hines, Adjunct Associate Professor  
Harold D. Holder, Lecturer  
<sup>1</sup>Lydia Say Holley, Associate Professor  
William G. Hollister, Lecturer  
John Thomas Hughes, Professor and Professor Dental Ecology  
William F. Jessee, Associate Professor  
Daniel C. Jones, Lecturer  
Arnold Daniel Kaluzny, Professor  
Kandiah Kanagaratnam, Adjunct Professor  
Thomas R. Konrad, Adjunct Assistant Professor  
Jacob Koomen, Clinical Professor  
Alan K. Kronhaus, Clinical Assistant Professor  
Ronald H. Levine, Adjunct Associate Professor  
James W. Luckey, Clinical Assistant Professor  
Curtis P. McLaughlin, Professor and Professor of Business Administration  
Donald L. Madison, Associate Professor and Associate Professor of Family  
Medicine

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<sup>1</sup>Died, April 19, 1981

William Fred Mayes, Professor Emeritus  
 Nancy Milio, Professor and Professor of Nursing  
 Kenneth Mills, Lecturer  
 Robert Burns Moorhead, Lecturer and Associate Dean  
 Eric B. Munson, Clinical Associate Professor  
 George M. Neely, Assistant Professor  
 James W. Osberg, Adjunct Professor  
 Barnett R. Parker, Assistant Professor  
 Harry T. Phillips, Professor  
 K.V. Ranganathan, Adjunct Professor  
 Daniel B. Reimer, Lecturer  
 Leonard S. Rosenfeld, Professor  
 Richard Gary Rozier, Research Assistant Professor  
 Morris Schaefer, Professor  
 George M. Stockbridge, Lecturer  
 James D. Suver, Visiting Professor  
 Hugh Tilson, Adjunct Professor  
 James E. Veney, Professor  
 Patricia F. Waller, Research Professors  
 David G. Warren, Adjunct Professor  
 Kenneth R. Wing, Assistant Professor and Assistant Professor School of Law  
 John Joseph Wright, Professor Emeritus  
 William M. Zelman, Assistant Professor

The Department of Health Policy and Administration offers educational programs at the undergraduate, master's, doctoral, and post-doctoral levels. Each of these programs has special characteristics.

The undergraduate studies (BSPH degree) in health administration are designed to prepare students for entry-level positions as managers of small facilities, mid-level administrators in larger facilities, and a variety of staff positions in health and health-related organizations. For information about this program see page 22 of this catalog and *The Undergraduate Bulletin*.

The Department offers two master's degree programs; the Master of Public Health (MPH) and Master of Science in Public Health (MSPH).

The MPH degree is 12-months long and designed for those who already hold a graduate-level professional degree (MD, DDS, JD, PhD, etc.) and/or those who have at least a bachelor's degree and three years of experience in administration involving substantial and highly discretionary responsibilities in planning and management. This degree is not intended to prepare highly skilled policy administrators, planners, or administrators but is expected to help those who are likely to occupy important leadership roles due to their professional training and experience, and who hope to become more effective as a result of systematic understanding of the scope, values, and approaches of the public health field, as well as the fundamentals of managerial and policy determination processes. The program of study is rather structured and provides for only a few electives.

The MSPH degree is 21-months long and is designed to prepare skilled professionals for health policy, planning and management positions. Those

holding professional degrees (MD, DDS, JD, etc) who seek such careers should apply for MSPH degree programs as should those who hold bachelor's and master's degrees. During the first year the program of study primarily consists of required courses; most of the second year courses are elective to facilitate specialization in any of the following areas: (1) Health Policy, Planning and Evaluation, (2) Medical Care and Hospital Administration, (3) Community Health Service Administration; (4) Mental Health Policy and Administration, (5) Dental Public Health Administration, and (6) Population Policy and Program Administration. For students interested in other areas of health, such as Aging, Rural Health, Occupational Health, International Health, etc., special arrangements can be made. Since the MSPH degree is based on a rigorous program of study, proficiency in economics, mathematics and accounting is required although a record of formal courses in these fields is not an admission requirement.

By special arrangements Master's degree programs may also be pursued simultaneously with several other degrees. The following combined degree arrangements have been formally approved: MD/MPH, DDS/MPH, JD/MPH, PhD (Geography)-MPH, and MSPH/Certificate in Community Psychiatry. Interested students should contact the Department for further details.

The Department also offers two non-residential MPH degree programs designed for full-time administrators in health and human service agencies. The Off-Campus Program provides instruction one day a week during the regular academic year at a site accessible to students in Western and Eastern North Carolina areas. These programs are offered on a three-year cycle. The Regional Master's Degree Program provides instruction through a combination of six-week summer school sessions, integrated residential and non-residential courses, and added transfer options to reach health administrators over a wider geographic area. This program will be accepting a new class of forty students in the Summer of 1982. Both the Off-Campus Program and Regional Degree Program include the same course requirements, faculty, and student expectations as the residential MPH program.

Studies for the doctoral degree are organized in two tracks: the PhD to prepare academicians and researchers in health policy and management and the DrPH (Doctor of Public Health) to prepare senior administrators and analysts for health and human service agencies.

Admission requirements for the DrPH program are a master's degree in public health or an equivalent degree from an accredited university and at least two years of experience in the health field. In addition, students entering the program are expected to have completed graduate level courses in the following areas: one year of graduate statistics with emphasis on multi-regression and analysis of variance techniques, one semester of graduate level research methodology, and one semester of intermediate microeconomics.

Admission requirements for the PhD program include a master's of science degree in public health or equivalent degree from an accredited university. In addition, students entering the program are expected to have completed graduate level courses in the following areas: one year of graduate statistics with emphasis on multi-regression and analysis of variance tech-

niques, one semester of graduate level research methodology, and one semester of intermediate microeconomics.

Both these tracks are rigorous academic programs and require superior academic preparation, maturity and leadership qualities. The difference between the two tracks is not of quality but of purpose.

The Post-Doctoral program provides advanced training in research in the health service field. The program is tailored to the specific needs of individual fellows and may involve a methodologically oriented program of research or may concentrate on the study of a special aspect of one or more speciality areas in health administration. Participation in the program is available to both new doctorates and established scholars and professionals holding doctoral degrees in health, administration, or social sciences. Post-Doctoral Fellows are appointed for one to two years duration and are expected to be in residence in the Department on a full-time basis.

In addition to Graduate School and the School of Public Health requirements for graduate admission, the Department requires GRE General Aptitude scores, and completion of a "Supplementary Information Sheet" available from the Department.

Financial assistance is available to qualified graduate students on a competitive basis.

Detailed information on the various programs of study, curriculum, faculty, Departmental organizations, and other matters is published in the Departmental catalog. Copies are available on request from the Department of Health Policy and Administration.

## MATERNAL AND CHILD HEALTH

**Chairman**—C. Arden Miller, Professor

**Assistant to Chairman**—Lewis Roland

**Registrar**—Betty Rogers—Telephone No. (919) 966-2017

### FACULTY

Karl F. Bauman, Professor

Gary Berger, Adjunct Associate Professor

Pouru Bhiwandiwalla, Adjunct Assistant Professor

Sidney Shaw Chipman, Professor Emeritus

Raphael DiNapoli, Lecturer

Michael F. Durfee, Lecturer and Associate Professor of Pediatrics

Anita Farel, Lecturer

Geraldine Gourley, Associate Professor Emerita

Robert A. Greenburg, Lecturer and Associate Professor of Pediatrics

Joseph L. Holliday, Adjunct Assistant Professor

Dorothy Howze, Assistant Professor

Cathee J. Huber, Lecturer and Assistant Professor of Nursing

Jaroslav Fabian Hulka, Professor and Professor of Obstetrics and Gynecology

Howard Jacobson, Clinical Professor and Director, Institute of Nutrition

Jonathan Kotch, Assistant Professor  
Joan S. Lipsitz, Clinical Assistant Professor and Director, Center for Early  
Adolescence  
Frank Aloysius Loda, Lecturer and Associate Professor of Pediatrics  
Merry-K Moos, Clinical Instructor  
Sarah Taylor Morrow, Adjunct Professor  
Richard R. Nugent, Adjunct Assistant Professor  
Khairia Omran, Adjunct Associate Professor  
Mary Peoples, Assistant Professor  
Marva M. Price, Lecturer and Adjunct Instructor in Nursing  
Jimmie L. Rhyne, Adjunct Instructor  
Franz Weston Rosa, Adjunct Professor  
Earl S. Schaefer, Professor  
Lisbeth Schorr, Visiting Professor  
Earl Siegel, Professor  
E. Barbara Stocking, Associate Professor Emerita  
Ingrid Swenson, Assistant Professor and Assistant Professor of Nursing  
J. Richard Udry, Professor  
Elizabeth Watkins, Professor

The Department of Maternal and Child Health is strongly committed to improving the health of women, children, and their families through programs of education, research, and community service. The educational mission of the Department is described here.

The educational programs prepare physicians, nurses, social workers, and others for leadership positions in public health which are related to such areas as maternity care and family planning, child care and development, comprehensive family-centered health care, and related aspects of consumer and community development, policy, and legislation. A favorable faculty-student ratio is maintained, with learning experiences enhanced by the multidisciplinary composition of faculty and students.

A rich variety of interdisciplinary programs in the area provide opportunities for students to develop special interests. These include the Health Services Research Center, Carolina Population Center, Division for Disorders of Development and Learning, Frank Porter Graham Child Development Center, Area Health Education Centers, North Carolina State Division of Health Services and a rural program of community development and comprehensive health services.

Students with interest in the broad field of maternal and child health pursue a program leading to the Master of Public Health degree. Students having a special interest such as family planning and population studies or child care and development may follow a more specialized program which leads to the Master of Science in Public Health degree. Programs usually cover two sixteen week semesters and a twelve week summer period, although longer programs may be necessary. Course sequencing restrictions ordinarily require students to enter the program in the fall semester.

Core and elective courses and field work are the major elements of each program. Biostatistics, epidemiology and environmental health are required

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<sup>1</sup>Retired June 30, 1981

of all students to provide knowledge and skills in the sciences basic to public health. Foundation courses in maternal and child health are also required. Electives may be drawn from many departments of the University. Community-based learning experiences are an integral part of the educational program, with field work assignments individually tailored by the student and faculty adviser.

Departmental courses focus on programs for mothers; children, and families, and include the historical development, essential content, characteristics and planning processes. Biologic, sociocultural and psychological factors are considered as they relate to health needs and problems of maternal-infant health and family planning. Child health problems are given high priority, with opportunity provided to integrate this knowledge with techniques of program planning, implementation and evaluation. Skills in advocacy, interdisciplinary teamwork, consultation, and research utilization are also taught by the Department.

All students who enroll in the MPH or the MSPH degree programs, must meet University requirements for admission to the Graduate School. In addition, the Department admits students whose career goals are firmly based in fields related to maternal and child health and who hold prior degrees in the health professions, as follows:

- (1) Medicine—MD or equivalent; consideration is also given to medical students who may exercise an option to complete medical and public health study concurrently, and to physicians who are engaged in residency training or other post-doctoral study who wish to complete public health study simultaneously.
- (2) Nursing—Clinical master's degree in maternity or pediatric nursing, preparation in an approved program of nurse-midwifery or preparation as a nurse practitioner in a relevant practice area, or a bachelor of science in nursing with at least two years of community health experience;
- (3) Social Work—Master of Social Work;
- (4) Other—Professional degrees in dentistry, physical or occupational therapy, education, and other related fields.

Preference is given to health professionals with community health experience.

Applicants who hold baccalaureate degrees from accredited programs in social work as well as in a broad range of other related academic fields are considered for admission provided they have been employed for at least two years in a community health-related position and have firm educational and career goals.

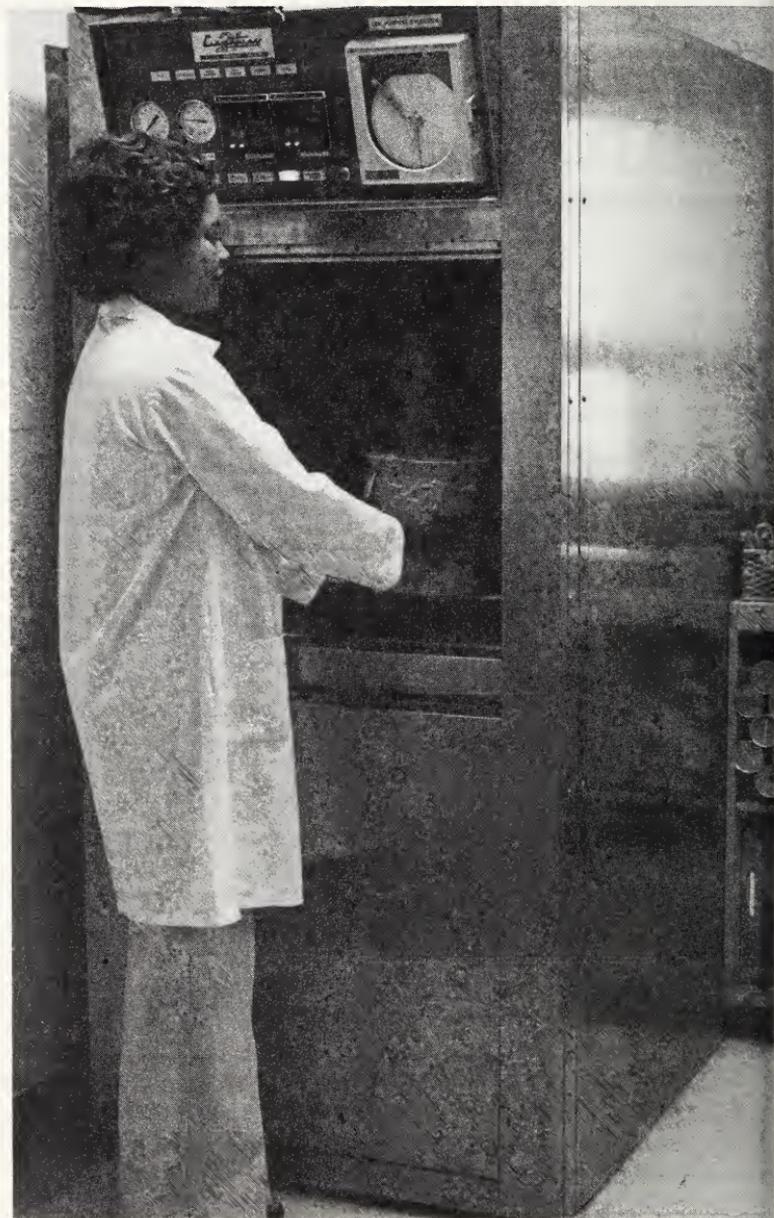
Fellowships and scholarships are available in some years covering tuition, fees, and reasonable living expenses.

The DrPH in maternal and child health is offered for selected individuals who have previously earned a prior master's or equivalent or with a prior degree in a related field.

The DrPH program provides an opportunity for further study of the biologic, cultural and environmental factors influencing the health of mothers, children and their families; the development of investigative skills; and the application of knowledge, skills and techniques to the improvement of the health

of mothers and children. Students will indicate upon application whether they will emphasize the substantive area of child care and development, human reproduction, or related areas.

A minimum of two academic years of course work and directed research is



required. Required courses include biostatistics, epidemiology, and environmental science, and an additional minimum of 18 semester hours as determined by the student's doctoral committee. A Departmental seminar is required each semester in residence.

## NUTRITION

**Chairman**—Joseph C. Edozien

**Registrar**—Jo Ann Roth Telephone No. (919) 966-1157

### FACULTY

John J.B. Anderson, Professor

Carolyn Barrett, Adjunct Assistant Professor

Rebecca B. Bryan, Associate Professor Emerita

Jean C. Burge, Assistant Professor

Thomas Chegash, Adjunct Assistant Professor

Marie T. Fanelli, Assistant Professor

Mary Ann C. Farthing, Clinical Associate Professor

William A. Forsythe, Assistant Professor

Barbara A. Hughes, Adjunct Associate Professor

Nancy L. Johnson, Adjunct Assistant Professor

Mildred Kaufman, Associate Professor

Frederic W. Nordsiek, Adjunct Professor

Barry M. Popkin, Associate Professor

Stephen R. Schroeder, Adjunct Associate Professor

Boyd R. Switzer, Associate Professor

### Graduate Assistants

Joane Doyle

Pamela Haines

Robert Kuczumarski

Judith Litvin

Marilyn Medaugh

The programs of study in Nutrition are designed to prepare qualified individuals for careers in public health nutrition. Through these programs a broad curriculum in public health sciences is provided as well as courses in the physiological, biochemical, and behavioral aspects of nutrition and their application to the health of human populations. The programs currently offered lead to BSPH, MPH, and DrPH degrees.

The objective of the BSPH program in nutrition is to provide undergraduate training for students wishing to enter beginning level positions in community and public health nutrition or to pursue graduate training in nutrition, medicine, or dentistry. Application procedures and program descriptions may be found on page 22 of this catalog and in *The Undergraduate Bulletin*.

Applicants for all graduate programs should have a "B" average or better

and are required to submit Graduate Record Examination (GRE) scores. Applicants whose native language is not English are required to take the Test of English as a Foreign Language (TOEFL) in addition to the usual requirements. A brief autobiographical letter, not to exceed one typewritten page, is required which states the person's reason for applying to this degree program and his/her future career goals. Graduates in medicine and dentistry are encouraged to apply for admission to the programs and may submit Medical or Dental Aptitude Test scores in lieu of GRE scores.

Prerequisites for the MPH program include the equivalent of four semesters (two academic years) of the biological sciences (course in anatomy and physiology strongly recommended), two semesters (one academic year) of chemistry (organic chemistry required), two courses in social sciences (such as anthropology, psychology, or sociology), and one introductory course in human nutrition. Deficiencies in course prerequisites must be rectified prior to admission.

The MPH program in nutrition provides training in the broad field of public health, in-depth training in the biological and behavioral aspects of foods and human nutrition, an understanding of nutrition problems in the community and the application of public health methods to their solution, and clinical and field experiences in the delivery of nutrition services under faculty supervision.

To achieve these goals the MPH program is designed to permit each student to gain a strong background in the science and practice of public health. Students take the core courses required by the School as stated on page 25 of this catalog. They are also expected to acquire a sound knowledge of the science of human nutrition. This objective is achieved through such courses as **Cell Biology** (NUTR 150), **Meal Planning, Food Selection and Preparation** (NUTR 152); **Human Nutrition** (NUTR 154); **Therapeutic Nutrition** (NUTR 157), **Food Production, Processing and Packaging** (NUTR 153), **Food Habits** (NUTR 159), **Economics of Nutrition and Public Health** (NUTR 160), **Maternal, Infant and Child Nutrition** (NUTR 200); **Nutrition of Adults and the Elderly** (NUTR 201); and **Nutritional Pathology** (NUTR 202). Lastly, a working knowledge of community nutrition programs and services coupled with adequate opportunities for concurrent block field experience is used to further strengthen classroom and laboratory experiences.

The student's program must include a minimum of 30 semester hours. Completion of the requirements normally takes 24 months; during the period opportunities are provided to build a basic knowledge in foods and nutrition, to receive clinical instruction and to take a wide variety of elective courses. For those candidates with training in dietetics, medicine or dentistry, requirements may be completed in 11-24 months depending on previous training and experience.

Students must pass a written, closed-book comprehensive examination after they have completed the course requirements. This two-part examination covers and integrates three general areas of biological and clinical aspects of nutrition, behavioral aspects of food and nutrition, and public health nutrition. Choice of questions will be allowed in the examination. Students are ad-

vised to consider these examination requirements in their selection of elective nutrition courses.

A master's degree in nutrition (or its equivalent) is required for admission to the DrPH program. Applicants that have not received the MPH degree must satisfactorily complete the requirements of the School of Public Health for the MPH degree before admission to candidacy. Applicants to the program are encouraged to arrange for a personal interview whenever possible.

A wide range of coursework is available. At the end of the first year of residence, doctoral students must take a written examination which tests competencies in the areas of basic and clinical nutrition, behavioral aspects of nutrition, and public health aspects of nutrition. Following satisfactory completion of the doctoral written and oral examinations, the student proceeds with a research project and dissertation under the guidance of an adviser and doctoral faculty committee. Research emphases are in the laboratory and community areas of nutrition.



# PARASITOLOGY AND LABORATORY PRACTICE

Chairman—John R. Seed, Professor

## FACULTY

Libero Ajello, Adjunct Associate Professor  
W. Emmett Barkley, Adjunct Associate Professor  
Joseph H. Boutwell, Adjunct Instructor  
Don J. Brenner, Adjunct Associate Professor  
Marion M. Brooke, Adjunct Professor  
John B. Brooks, Adjunct Associate Professor  
Edward L. Cavanaugh, Adjunct Associate Professor  
Elmer F. Chaffee, Associate Professor Emeritus  
Harry Daugharty, Adjunct Associate Professor  
Robert E. Desjardins, Adjunct Associate Professor  
Walter R. Dowdle, Adjunct Associate Professor  
Vulus Raymond Dowell, Jr., Adjunct Professor  
Bruce L. Evatt, Adjunct Associate Professor  
John J. Farmer, III, Adjunct Associate Professor  
John C. Feeley, Adjunct Associate Professor  
John E. Forney, Adjunct Associate Professor  
John W. Foster, Adjunct Associate Professor  
Hilton T. Goulson, Professor  
James E. Hall, Assistant Professor  
William H. Hannon, Adjunct Associate Professor  
Charles L. Hatheway, Adjunct Associate Professor  
James R. Hendricks, Associate Professor  
Wallis L. Jones, Adjunct Associate Professor  
William Kaplan, Adjunct Professor  
Leo Kaufman, Adjunct Professor  
Alan P. Kendall, Adjunct Associate Professor  
Mildred A. Kerbaugh, Adjunct Associate Professor  
Edna H. Knott, Adjunct Instructor  
<sup>1</sup>John E. Larsh, Jr., Professor Emeritus  
Malcolm A. Martin, Adjunct Associate Professor  
Joseph B. McCormick, Adjunct Associate Professor  
Robert W. McKinney, Adjunct Assistant Professor  
Max D. Moody, Adjunct Associate Professor  
Claude W. Moss, Adjunct Associate Professor  
John F. Obijeski, Adjunct Associate Professor  
James P. O'Connell, Adjunct Assistant Professor  
Charles H. Okey, Clinical Associate Professor  
Athos Ottolenghi, Adjunct Professor  
Erskine L. Palmer, Adjunct Associate Professor  
G. Briggs Phillips, Adjunct Professor  
Leo Pine, Adjunct Associate Professor

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<sup>1</sup>Retired, June 30, 1981.

John K. Read, Associate Professor  
 Charles B. Reimer, Adjunct Associate Professor  
 Errol Reiss, Adjunct Associate Professor  
 Eric B. Sansone, Adjunct Associate Professor  
 Ernest Schoenfeld, Clinical Assistant Professor  
 Charles C. Shepard, Adjunct Associate Professor  
 Steven L. Shore, Adjunct Associate Professor  
 Peter B. Smith, Adjunct Associate Professor  
 Francis W. Spierto, Adjunct Associate Professor  
 John A. Stewart, Adjunct Associate Professor  
 Connie J. Stone, Adjunct Assistant Professor  
 W. Daniel Sudia, Adjunct Associate Professor  
 Alexander J. Sulzer, Adjunct Associate Professor  
 Clyde Thornsberry, Adjunct Associate Professor  
 Jerry J. Tulis, Clinical Professor  
 H. Mac Vandiviere, Adjunct Associate Professor  
 I. Kaye Wachsmuth, Adjunct Associate Professor  
 Kenneth W. Walls, Adjunct Associate Professor  
 Norman F. Weatherly, Professor  
 Hazel W. Wilkinson, Adjunct Assistant Professor  
 Donald W. Ziegler, Adjunct Associate Professor

The Department of Parasitology and Laboratory Practice offers four graduate degree programs.

The Master of Public Health program of study is intended primarily for those with experience in clinical or public health microbiology and requires a minimum of one academic year (nine months). The requirements for admission and for the degree are listed on pages 24-27 of this catalog.

Students are required to take the basic courses in biostatistics (BIOS 101), epidemiology (EPID 160), environmental sciences (ENVR 101), and health administration (HPAA 105). In addition they must also study **Human Parasitology** (PALP 134), **Problems in Public Health Laboratory Practice** (PALP 142), **Public Health Bacteriology** (PALP 150), **Public Health Virology** (PALP 151), and **Seminar in Public Health Laboratory Practice** (PALP 333).

Electives may be chosen from a variety of Department, School, and campus courses including Nature of Parasitism, Parasitological and Laboratory Methods, and Medical Entomology.

The program of study of the Master of Science in Public Health requires a minimum of one academic year (nine months) and is intended primarily for those who either plan to pursue a career in some phase of medical parasitology or who plan to proceed in a Doctor of Philosophy degree program. The requirements for admission and for the degree are listed on pages 27-28 of this catalog.

Students in this degree program are also required to take basic courses in biostatistics, epidemiology, and environmental sciences. Major parasitology courses are **Parasitism and Human Disease** (PALP 131), **Human Parasitology** (PALP 134), **Problems and Methods and Seminar in Parasitology** (PALP 140, 232, and 331), **Nature of Parasitism** (PALP 230), and **Medical Entomology**

(PALP 234). **Biochemistry** (BIOC 100) and **Administrative Epidemiology** (HPAA 228) are possible electives.

The program of study in Public Health Laboratory Practice leading to the Doctor of Public Health degree is planned individually for each student based on previous academic preparation, laboratory experience, future plans, and personal interest. The requirements for admission and for the degree are listed on pages 30-33 of this catalog. All students are required to take **Biochemistry** (BIOC 100), **Public Health Laboratory Methods** (PALP 250, 251) and **Management** (PALP 260, 261), **Problems in Public Health Laboratory Methodology** (PALP 235), and **Seminar in Public Health Laboratory Practice** (PALP 333). Research competence is gained in PALP 336.

The Department also offers a program in Biohazard Science that leads to both the Master of Public Health and Doctor of Public Health degrees. Required courses for the MPH degree include **Biohazard Science I** (PALP 270), **Biohazard Science II** (PALP 271), **Laboratory Methods in Biohazard Science** (PALP 275), plus other required departmental courses (i.e., BIOS 101, EPID 160, ENVR 101, HPAA 105, and PALP 134, 150 or 151). The program of study for the MPH program requires a minimum of 10 months course work and is intended primarily for those who either plan to pursue a research, teaching, or administrative career in some phase of biohazard science or who intend to proceed in a Doctor of Public Health degree program. The latter program is planned individually for each student based on previous academic training and work experience, future plans, and personal interest. Required courses besides those listed for the MPH degree, include **Advanced Studies in Biohazard Science** (PALP 276), **Special Topics in Biohazard Science** (PALP 277), **Public Health Laboratory Management** (PALP 260 and 261), **Biochemistry** (BIOC 100), **Problems in Public Health Laboratory Methodology** (PALP 235), **Seminar in Public Health Laboratory Practice** (PALP 333) and **Research** (PALP 336, 337).

The course program leading to the Doctor of Philosophy degree may be taken on a major-minor basis between the Department of Parasitology and Laboratory Practice and one or more departments within the University. An applicant may elect to minor in zoology, botany, bacteriology, or any other areas approved by his study committee. Each student's program is planned individually in terms of previous preparation and experience, future plans and interest.

Teaching experience is an essential part of professional training in this Department. Therefore, laboratory instruction equivalent to six contact hours a week for two semesters, or until teaching competence is acquired, is required for all PhD candidates.



## PUBLIC HEALTH NURSING

**Chairman**—Dorothy McComb Talbot, Professor

**Registrar**—Sharon Lambe Pickard — Telephone No. (919) 966-1050

### FACULTY

- Rudith Lee Adams, Assistant Professor
- Marilyn Asay, Clinical Assistant Professor
- Jora Frances Cline, Associate Professor Emerita
- Elizabeth Merrill Edmands, Associate Professor Emerita
- Estelle Marie Fulp, Adjunct Associate Professor
- Rose Geraldine George, Assistant Professor Emerita
- Ann Caton Hansen, Associate Professor Emerita
- D. Marie Henry, Adjunct Associate Professor
- Marion Elizabeth Highriter, Associate Professor
- Lois Simmons Isler, Adjunct Assistant Professor
- Sandra Lorraine Koerber, Assistant Professor
- Therese P. Lawler, Adjunct Assistant Professor
- Marie Justin McIntyre, Associate Professor Emerita
- Helen Jo McNeil, Adjunct Associate Professor
- Beatrice Bell Mongeau, Associate Professor Emerita
- Virginia Margaret Nelson, Associate Professor
- Charlene Claire Ossler, Clinical Assistant Professor

Resigned August 6, 1981.

Died March 21, 1981.

Emily Jones Rivenbark, Adjunct Instructor  
Doris Emma Roberts, Adjunct Professor  
<sup>3</sup>Robert Roy Robinson, Clinical Associate Professor  
Iris Reed Shannon, Adjunct Associate Professor  
<sup>4</sup>E. Barbara Stocking, Associate Professor Emerita  
Nancy Lou Tigar, Lecturer  
<sup>5</sup>Julia Day Watkins, Associate Professor Emerita  
Barbara Wilcox, Adjunct Associate Professor

The Department of Public Health Nursing provides graduate study in public health nursing and occupational health nursing. Students have the opportunity to choose an area of concentration such as supervision, administration, or education. Opportunities are provided for students to participate in faculty members' research, continuing education and technical assistance activities which are conducted throughout North Carolina and the region.

Although full-time enrollment is encouraged, students may choose to enroll part-time. Students are normally admitted at the beginning of the fall semester and must meet these general University requirements for admission to graduate studies. In addition to these general requirements, the Department of Public Health Nursing requires the following:

- A baccalaureate degree with a major in nursing from an NLN accredited program
- Evidence of Registered Nurse licensure
- Coverage by professional liability insurance
- Attainment of satisfactory scores on the Graduate Record Examination
- A minimum of one year's experience in a field related to public health nursing for the MPH degree. A minimum of two year's experience in a community health agency for the MS degree. For students in occupational health the experience for the respective degrees must be in a field related to occupational health nursing.

Consideration is given to those persons who do not meet the requirements.

The Department offers the Master of Public Health (MPH) with emphasis in public health nursing or occupational health nursing and the Master of Science (MS) degree with emphasis on preparation for teaching public health nursing or occupational health nursing.

The MPH program requires a minimum of eleven months and 30 semester credits. The MS program requires two academic years and 45 semester credits.

Programs are planned with faculty advisers on the basis of individual experience, needs and career goals. A minimum of twelve credits of public health nursing courses is required.

The program of study in the delivery of public health nursing services is designed to prepare nurses for collaboration on multidisciplinary teams in planning, conducting and evaluating community health services and for the

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<sup>3</sup>Resigned June 30, 1981.

<sup>4</sup>Retired June 30, 1981.

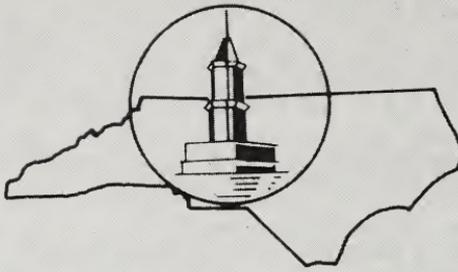
<sup>5</sup>Retired June 30, 1981.

design and delivery of public health nursing services. Required public health nursing courses include **Seminar in Public Health Nursing** (PHNU 300), and **Research Methods in Public Health Nursing** (PHNU 299) or its equivalent. Public health courses required for the MPH degree are listed on page 25. A written report on a subject pertinent to public health nursing is required in addition to satisfactory completion of a written comprehensive examination.

The program in occupational health nursing is designed to prepare nurses for collaboration on multidisciplinary teams in planning, conducting and evaluating occupational health services and for the design and delivery of occupational health nursing services. In addition to the School core requirements, students are required to take PHNU 281, PHNU 282, PHNU 300, and PHNU 396. Electives are selected from environmental sciences and other related fields.

The program leading to the MS degree is designed to prepare experienced nurses to teach content related to public health or occupational health nursing in university schools of nursing, as well as community and occupational health practice settings. Emphasis is on community health nursing practice and curriculum development. An illustrative curriculum for the MS degree would include a **Seminar on Public Health Nursing** (PHNU 300) and courses in public health nursing practice; the basic public health courses of **Biostatistics** (BIOS 101) and **Epidemiology** (EPID 160); **Principles and Practices of College Teaching** (EDCI 265), **Practicum and Instructional Approaches in Teaching** (PHNU 271, 272) and **Research Methods** (PHNU 299) or its equivalent. A master's thesis is required in addition to satisfactory completion of a written comprehensive examination. Electives are selected to meet individual needs.

The Department is currently offering a part-time Off-Campus MPH degree program in Hickory, North Carolina. In this program the student meets the MPH degree requirement of one year's full-time study in three years on a part-time basis.



# division

## **Division of Community Health Service**

**Director — Charles L. Harper**

**Unit Heads — Technical Assistance — Charles L. Harper**  
**AHEC — Howard C. Barnhill**  
**Continuing Education — Richard M. House**  
**Off-Campus — William T. Herzog**

In recognition of its public responsibility, the School is actively involved in community service throughout the state of North Carolina. Service projects in addition to providing direct assistance to agencies and professionals in the field, allow the School to demonstrate the relevance of teaching and research efforts to current community problems. The Division functions as an interface between the School and the health-related organizations in the state which form its constituency.

For students interested in community involvement the Division can provide resources ranging from information to financial assistance through the Technical Assistance Unit and the Area Health Education Centers Program Unit.

**The Technical Assistance Unit** promotes faculty consultation to agencies involved in planning, organizing, and delivering health services by matching agency needs with faculty resources. Increasingly, students are being included in teams working on technical assistance projects.

Students can obtain information about current technical assistance projects originating in any of the School's nine departments from the unit's quarterly reports or from the unit director. In addition, the Technical Assistance Unit can help students find appropriate learning opportunities in state, regional, and local agencies.

**The Area Health Education Centers Program (AHEC)** is designed to decentralize the education of health professionals and to strengthen regional resources for meeting health manpower training needs. Each of the five

chools in the University concerned with educating health professionals is linked with the nine regional AHEC offices through a network of coordinators. The AHEC Program Unit for the School of Public Health is located within the Division.

For students, AHEC provides advice and assistance in locating sites for concurrent and block field training. The AHEC office in the School receives local requests for student assistance via the regional offices scattered throughout the state. With knowledge of a student's interests and experience, the AHEC staff in the School can match agency requests with students requests for field placement.

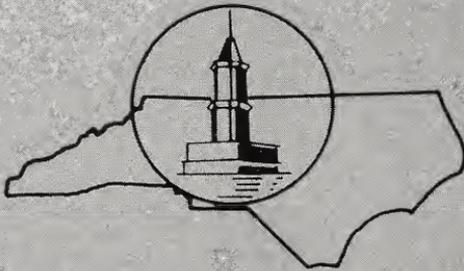
In addition, the AHEC Program has funds available for student travel and housing during field training. AHEC also supports and provides coordination for technical assistance and continuing education services provided through the Division.

**The Office of Continuing Education** coordinates the development of the school's programs for professionals in the field of public health. These programs have three primary objectives. (1) providing up-to-date information on scientific advances and innovations in the design and delivery of health and human services; (2) reducing the lag time between development of new knowledge and its application in practice; and (3) offering short term training in specialty areas not normally available in existing formal educational programs.

In addition, the Continuing Education Unit assists official and voluntary health agencies, professional associations, and other higher educational institutions in developing continuing education programs. Services provided by the Unit may include help in planning, developing, marketing, and conducting continuing education programs.

Through the **Off-Campus Master's Degree Program** health and other human service professionals can earn a master's degree without giving up full-time employment or disrupting family and community responsibilities. Academic standards for the program are equal to those for residential students. Admission requirements and study programs are available upon request.

The Associate Dean for Community Health Service and directors of the units described are available to answer further questions about the Division and its services.



## special programs

### **Carolina Population Center**

**Director—J. Richard Udry**

The Carolina Population Center provides coordination for a University-wide interdisciplinary program in population research and research training. Its efforts span the social, behavioral and health sciences. In addition to the School of Public Health departments (epidemiology, biostatistics, maternal and child health, and health policy and administration), primary populations courses are offered in anthropology, economics, geography, political science, psychology and sociology. These courses are chosen by the Population Training Committee of the Population Center to form a basic concentration of studies on population dynamics, policy, demography, and methodology.

The Department of Biostatistics provides courses in methods of demographic measurement, analysis, and modeling. The Department of Epidemiology deals with population dynamics and family planning, as well as methodology. In the Department of Health Policy and Administration, concentration is in population policy and administration. The Department of Maternal and Child Health is concerned with family planning and human reproduction.

Additional information concerning opportunities for special study in this field may be obtained from the heads of the departments listed above, or from the training office of the Carolina Population Center.

### **Institute for Environmental Studies**

**Director—Richard N.L. Andrews**

The Institute for Environmental Studies of the University of North Carolina at Chapel Hill is the successor to the Institute for Environmental Health Stud

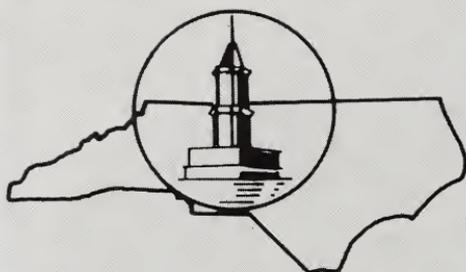
s which was organized on the Chapel Hill campus in 1966. Although it is administratively located within the Department of Environmental Sciences and Engineering, School of Public Health, the Institute is intended to serve as a campus-wide focal point for environmental studies. The general purposes of the Institute are to foster and coordinate interdisciplinary research, teaching, and service in environmental concerns among the various elements of the University of North Carolina at Chapel Hill. In addition, the Institute will assist in cooperative efforts on environmental matters between the Chapel Hill campus and other campuses of The University of North Carolina, with other colleges and universities and with governmental and private agencies. Some of the Institute's specific activities include sponsorship of the annual Environmental Studies Visiting Lecture Series, development of information for students concerning environmental courses and curricula, sponsorship of seminars and colloquia, development of interdisciplinary research proposals, and publication of the Carolina Environmental Essay Series.

## **Occupational Health Studies Group**

**Director — Robert L. Harris**

The Occupational Health Studies Group is an interdisciplinary research group involving the Departments of Biostatistics, Environmental Sciences and Engineering, and Epidemiology. The group conducts studies to identify work-related illness and causes of death, to identify environmental hazards and develop means for their elimination or control, and to develop recommendations for surveillance to permit early detection of health problems and hazards.

In the 1970's the OHSG conducted a major occupational health research program in the tire and rubber industry with support by the United Rubber, Cork, Linoleum, and Plastic Workers of America International Union and the General, Goodyear, Firestone and Uniroyal Companies. Some research projects continue in the tire and rubber industry. A new major research project has begun in the phosphate fertilizer industry with support from the Florida Phosphate Council. A cooperative program on health hazard evaluations in other industries is underway with the National Institute for Occupational Safety and Health. The research of the OHSG provides excellent opportunities for specialized training programs for students with specific interest in occupational health.



## faculty

- James Ralph Abernathy** (1965), *Professor of Biostatistics* — B.S., 1951 (Samford); M.S.P.H. 195 (The University of North Carolina); Ph.D., 1965 (The University of North Carolina at Chapel Hill)
- Judith L. Adams** (1976), *Assistant Professor of Public Health Nursing* — B.Sc., 1962 (Ohio State B.Sc., 1965, Ph.D., 1975 (Columbia)
- Arjun L. Adlakha** (1975), *Research Associate Professor of Biostatistics* — B.Sc., 1958, M.Sc., 196 (Agra University, India); M.A., 1962 (University of Delhi, India); M.A., 1969, Ph.D., 197 (Michigan)
- Libero Ajello** (1964), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — A.B., 1939, M.A., 1940, Ph.D., 1947 (Columbia)
- Phillip William Albro** (1981), *Adjunct Associate Professor of Environmental Sciences and Engineering* — B.A., 1961 (University of Rochester); Ph.D., 1968 (St. Louis University)
- James Elmore Allen** (1968), *Associate Professor of Health Administration, Lecturer in the Department of Religion, and Senior Research Associate, Carolina Population Center* — B.A. 1957 (Arizona); S.T.B., 1960, Ph.D., 1964 (Boston); M.S.P.H., 1969 (The University of North Carolina at Chapel Hill)
- John R. Allen** (1973), *Adjunct Instructor in Health Education* — B.S., 1950 (Wake Forest); M.S.P.H. 1952 (The University of North Carolina)
- John J. B. Anderson** (1971), *Professor of Nutrition* — B.A., 1956 (Williams College); M.A.T., 195 (Harvard University); M.A., 1962 (Boston University); Ph.D., 1966 (Cornell University)
- Dragana Andjelkovich** (1973), *Adjunct Associate Professor of Epidemiology* — M.D., 1958 (University of Belgrade, Yugoslavia); M.P.H., 1963, Dr.P.H., 1969 (Johns Hopkins)
- Richard N. L. Andrews** (1981), *Professor of Environmental Sciences and Engineering and Director of the Institute of Environmental Studies* — A.B., 1966, M.R.P., 1970 (Yale University Ph.D., 1972 (The University of North Carolina at Chapel Hill)
- Marilyn Kay Asay** (1980), *Clinical Assistant Professor of Public Health Nursing* — Diploma, 196 (Nebraska Methodist Hospital School of Nursing); B.S., 1964 (Nebraska Wesleyan University); M.S., 1980 (The University of North Carolina at Chapel Hill)
- Mahmoud Amin Ayoub** (1976), *Adjunct Professor of Environmental Sciences and Engineering* — B.S., 1964 (Cairo); M.S., 1969, Ph.D., 1971 (Texas Technological)
- Miriam Bachar** (1980), *Adjunct Assistant Professor of Health Education* — B.A., 1954 (Hunter College); M.S.Hyg., 1963 (University of Pittsburgh)
- Thomas J. Bacon** (1976), *Research Assistant Professor of Health Administration* — M.A., 197 (University of Chicago); Dr.P.H., 1977 (The University of North Carolina at Chapel Hill)

- hrikant Ishver Bangdiwala** (1980), *Research Assistant Professor of Biostatistics* — B.S., 1975, M.S., 1978, Ph.D., 1980 (The University of North Carolina at Chapel Hill)
- William E. Barkley** (1980), *Adjunct Associate Professor, Parasitology and Laboratory Practice* — B.C.E., 1961 (University of Virginia); M.S., 1966, Ph.D., 1972 (University of Minnesota)
- Howard Barnhill** (1973), *Clinical Associate Professor of Health Education* — B.S., 1938 (A & T State University); M.S.P.H., 1958 (North Carolina Central)
- Larriet Hylton Barr** (1965), *Clinical Assistant Professor of Health Education and Director of Public Relations*, — A.B., 1945 (Duke); M.P.H., 1948 (North Carolina)
- Carolyn J. Barrett** (1977), *Adjunct Assistant Professor, School of Public Health, Clinical Instructor, Department of Pediatrics Clinical Scientist, Child Development — Biological Science* — B.S., 1970 (Pennsylvania State University); M.S., 1972 (University of Kansas); M.P.H., 1977 (Tulane University)
- Patricia Z. Barry**, (1972), *Associate Professor of Health Administration* — B.A., 1957 (Stanford); M.A., 1960 (California); Dr.P.H., 1972 (The University of North Carolina at Chapel Hill)
- Mario C. Battigelli** (1965), *Professor of Medicine, Associate Professor of Family Medicine and Professor of Environmental Science in the School of Public Health* — M.D., 1951 (Florence, Italy); M.P.H., 1957 (Pittsburgh)
- Earl E. Bauman** (1966), *Professor of Maternal and Child Health* — A.B., 1961, M.A., 1963 (Nebraska); Ph.D., 1965 (Florida State)
- William Fred Baxter** (1979), *Lecturer of Health Administration* — A.B., 1952 (Guilford College); M.Ed., 1957 (The University of North Carolina at Greensboro); C.A.S.E., 1965 (Johns Hopkins)
- Jan E. Beauchamp** (1972), *Associate Professor of Health Administration, School of Public Health and Adjunct Associate Professor of Social and Administrative Medicine, School of Medicine* — A.B., 1962 (University of Texas); M.A., 1971, Ph.D., 1973 (Johns Hopkins University)
- Mary Caroline Becker** (1965), *Associate Professor of Epidemiology* — A.B., 1946 (Vanderbilt); M.D., 1950 (Johns Hopkins)
- Deborah E. Bender** (1976), *Adjunct Assistant Professor in Health Administration* — B.A., 1969 (Newton College); Ph.D., 1980 (American University, Washington)
- Gary S. Berger** (1980), *Adjunct Associate Professor of Maternal and Child Health* — A.B., 1965 (Harvard); M.D., 1969 (Rochester)
- Pouru P. Bhiwandiwalla** (1980), *Adjunct Assistant Professor of Maternal and Child Health* — M.B., 1968, B.S., 1968 (Bombay University); M.C.P.S., 1969, D.G.O., 1971, D.F.P., 1972, F.C.P.S., 1973 (College of Physicians and Surgeons); M.D., 1973 (Bombay University); M.S.P.H., 1977 (The University of North Carolina at Chapel Hill)
- Richard E. Bilsborrow** (1972), *Research Associate Professor of Biostatistics* — B.A., 1963 (Carleton); M.A., 1966, Ph.D., 1968 (Michigan)
- Linda S. Birnbaum** (1980), *Adjunct Assistant Professor of Environmental Sciences and Engineering* — B.A., 1967 (University of Rochester); M.S., 1969, Ph.D., 1972 (University of Illinois)
- Marvin Jerrold Block** (1972), *Associate Professor of Dental Oncology, School of Dentistry and Health Administration, School of Public Health* — B.S., 1943, D.D.S., 1946 (Ohio State); M.P.H., 1972 (Minnesota)
- Steven B. Blum** (1979), *Adjunct Assistant Professor of Epidemiology* — B.S., 1965 (City College of New York); M.A.T. 1972 (Rhode Island College); M.S., 1974 (University of Massachusetts, Amherst); Ph.D., 1977 (The University of North Carolina at Chapel Hill)
- Ralph Boatman, Jr.** (1960), *Professor of Health Education, School of Public Health, Director of the Offices of Allied Health Sciences and Continuing Education in the Health Sciences* — B.S.Ed., 1943 (Southern Illinois); M.P.H., 1947, Ph.D., 1954 (North Carolina)
- Joseph Boutwell** (1981), *Adjunct Instructor of Parasitology and Laboratory Practice* — B.S., 1939 (Wheaton College); M.S., 1941, M.D., 1949, Ph.D., 1947 (Northwestern University)
- Don J. Brenner** (1973), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1957 (Marietta); M.S., 1960 (Long Island); Ph.D., 1966 (Washington, Seattle)

- John Briscoe** (1981), *Visiting Assistant Professor of Environmental Engineering* — B.S., 196 (University of Capetown South Africa); M.S., 1972, Ph.D., 1976 (Harvard University)
- Marion M. Brooke** (1964), *Adjunct Professor of Parasitology and Laboratory Practice (Field)* — A.B., 1935, M.A., 1936 (Emory); Sc.D., 1942 (Johns Hopkins)
- John Bill Brooks** (1973), *Adjunct Associate Professor of Parasitology and Laboratory Practice* — B.S., 1962 (Western Carolina University); Ph.D., 1969 (Virginia Polytechnic Institute)
- Rebecca Broach Bryan** (1959), *Associate Professor of Nutrition, Emerita (1977)* — B.S., 1934 M.S., 1944 (Georgia); M.P.H., 1952 (The University of North Carolina)
- Jean Cathleen Burge** (1979), *Assistant Professor of Nutrition* — B.S., 1969, M.S., 1971, Ph.D., 197 (Michigan State University)
- B.J. Campbell** (1967), *Lecturer in Health Administration, Research Professor of Psychology and Director, Highway Safety Research Center* — B.A., 1951, M.A., 1953 (Texas Christian Ph.D., 1960 (North Carolina)
- Darryl Candy** (1978), *Clinical Assistant Professor of Health Education* — M.B., 1962, B.S., 196 (London)
- Moses Carey, Jr.** (1981), *Clinical Assistant Professor of Health Administration* — M.S.P.H., 1972 J.D., 1980 (The University of North Carolina at Chapel Hill)
- Edward L. Cavanaugh** (1978), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — A.A., 1949 (Mars Hill College); B.S., 1951 (East Carolina); M.P.H., 1963 (The University of North Carolina at Chapel Hill); Dr.P.H., 1968 (California, Berkeley)
- Elmer F. Chaffee** (1966), *Associate Professor of Parasitology and Laboratory Practice, Emeritus (1976)* — B.S., 1938 (Idaho); M.S.P.H., 1947 (The University of North Carolina); Ph.D., 1952 (Duke)
- Lloyd E. Chambless** (1981), *Visiting Associate Professor of Biostatistics* — A.B., 1964, (University of Florida, Gainesville); M.A., 1969 (University of Illinois, Urbana); Ph.D., 1979, (University of North Carolina at Chapel Hill)
- Edward L. Chaney** (1979), *Adjunct Associate Professor of Radiological Hygiene, Department of Environmental Sciences and Engineering and Associate Professor of Radiology, School of Medicine* — B.S., 1965 (Millsaps College); Ph.D., 1969 (Tennessee)
- Emil Theodore Chanlett** (1946), *Professor of Sanitary Engineering, Emeritus (1981)* — B.S., 1937 (College of the City of New York); M.S.P.H., 1939 (Columbia); M.S.S.E., 1941 (North Carolina) Retired June 30, 1981.
- Harvey Checkoway** (1979), *Research Assistant Professor of Epidemiology* — B.A., 1971 (Boston University); M.P.H., 1975 (Yale University); Ph.D., 1978 (The University of North Carolina at Chapel Hill)
- Thomas J. Chegash** (1980), *Adjunct Assistant Professor of Nutrition* — B.S., 1971 (Cornell University); M.B.S., 1977 (George Washington University)
- Sidney Shaw Chipman** (1950), *Professor of Maternal and Child Health, Emeritus (1970)* — B.A. 1924 (Acadia); M.D., 1928 (McGill); M.P.H., 1947 (Yale); D.Sc.Hon., 1971 (Acadia)
- Russell Fabrique Christman** (1973), *Professor of Environmental Sciences and Chairman of the Department of Environmental Sciences and Engineering* — B.S., 1958, M.S., 1960, Ph.D. 1962 (Florida)
- Eva Clayton** (1973), *Adjunct Assistant Professor of Health Education* — B.S., 1955 (Johnson C Smith University); M.S., 1961 (North Carolina Central University)
- Nora Francis Cline** (1961), *Associate Professor of Public Health Nursing, Emerita (1978)* — R.N. 1945, B.S., 1945 (Duquesne); M.L., 1948 (Pittsburgh)
- Warren A. Cook** (1971), *Adjunct Professor of Industrial Health in the Department of Environmental Sciences and Engineering* — A.B., 1923 (Dartmouth)
- Elizabeth Jackson Coulter** (1965), *Professor of Biostatistics and Associate Dean for Undergraduate Studies* — A.B., 1941 (Swarthmore); A.M., 1946, Ph.D., 1948 (Radcliffe)
- John P. Creason** (1978), *Adjunct Assistant Professor of Biostatistics* — B.S., 1964, M.S., 1967 (University of Missouri); Ph.D., 1978 (The University of North Carolina at Chapel Hill)

- Wrence M. Cutchin** (1978), *Adjunct Associate Professor of Social and Administrative Medicine, Family Medicine, Clinical Associate Professor, and Clinical Associate Professor of Epidemiology, School of Public Health* — A.B., 1958, M.D., 1962 (North Carolina)
- Donald R. Dancy** (1971), *Adjunct Assistant Professor of Health Education* — B.S., 1951 (East Tennessee State); M.P.H., 1954 (The University of North Carolina)
- Ann Daniels** (1979), *Adjunct Instructor of Health Education* — B.S., 1973 (North Carolina Central University); M.Ed., 1979 (University of North Carolina at Greensboro)
- Harry Daugharty** (1977), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — A.B., 1961 (Emory); M.S., 1965, Ph.D., 1967 (Medical College of Georgia)
- Graham S. David** (1969), *Adjunct Professor of Health Administration* — B.S., 1958, M.Sc., 1960 (Purdue); M.S.P.H., 1968 (The University of North Carolina at Chapel Hill); Ph.D., 1969 (North Carolina State)
- Michael Davies** (1980), *Clinical Assistant Professor in Health Education* — B.A., 1974 (University of Arizona); M.A., 1979 (University of California at Los Angeles)
- Lawrence Edward Davis** (1972), *Associate Professor of Biostatistics* — B.A., 1963 (Howard Payne College); M.S., 1965 (Tulane); Ph.D., 1970 (North Carolina State University)
- Leonard H. Dawson** (1966), *Clinical Assistant Professor of Health Education* — A.B., 1960 (Kentucky); M.S.P.H., 1963 (The University of North Carolina at Chapel Hill)
- Leonard H. DeFriese** (1971), *Associate Professor of Social Administrative Medicine, Epidemiology, Medicine, and Director, Health Services Research Center* — B.S., 1963 (Middle Tennessee State); M.A., 1966, Ph.D., 1967 (Kentucky)
- David Mahlon DeLong** (1979), *Adjunct Assistant Professor in Biostatistics* — B.S., 1969 (University of Maine, Orono); M.S., 1975, Ph.D., 1977 (The University of North Carolina at Chapel Hill)
- Elizabeth Ray DeLong** (1979), *Adjunct Assistant Professor in Biostatistics* — B.A., 1969, M.A., 1970 (University of Maine, Orono); Ph.D., 1979 (The University of North Carolina at Chapel Hill)
- Basil G. Delta** (1980), *Lecturer in Health Administration* — M.D., 1952 (University of Istanbul - Turkey); M.P.H., 1975 (Johns Hopkins University)
- John M. Dement** (1981), *Adjunct Associate Professor of Air and Industrial Hygiene* — B.S., 1971 (North Carolina State University); M.S., 1972 (Harvard University); Ph.D., 1980 (University of North Carolina at Chapel Hill)
- Robert E. Desjardins** (1981), *Adjunct Associate Professor, Parasitology and Laboratory Practice* — M.D., 1971 (Loyola University)
- Frederica McEvoy DeVellis** (1978), *Assistant Professor of Health Education* — B.A., 1969 (Massachusetts); M.A., 1973 (Connecticut College); Ph.D., 1978 (George Peabody College)
- Robert DeVellis** (1981), *Adjunct Assistant Professor of Health Education* — B.S., 1970 (University of Massachusetts); M.A., 1973 (Connecticut College-Ct.); Ph.D., 1977 (George Peabody College)
- Francis A. Digiano** (1981), *Professor of Water Resources Engineering in the Department of Environmental Sciences and Engineering* — B.S.C.E., 1964 (University of Massachusetts); M.S.C.Em., 1965 (Tufts University); Ph.D., 1969 (University of Michigan)
- Joseph J. DiNapoli, Jr.** (1981), *Lecturer in Maternal and Child Health* — B.A., 1955 (Holy Cross College); M.D., 1959 (State University of New York); M.P.H., 1964 (Harvard University)
- James P. Dixon** (1976), *Clinical Professor of Health Administration* — B.S., 1939 (Antioch); M.D., 1943 (Harvard); M.S., 1947 (Columbia)
- Walter R. Dowdle** (1965), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1955, M.S., 1957 (Alabama); Ph.D., 1960 (Maryland)
- Julius Raymond Dowell, Jr.** (1967), *Adjunct Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1961 (Kentucky); M.S., 1962, Ph.D., 1966 (Cincinnati)
- George Grundy Dudley** (1967), *Adjunct Professor of Health Administration* — B.S., 1951 (Tennessee Tech.); D.D.S., 1953 (Tennessee); M.P.H., 1962 (The University of North Carolina)

- David W. Dunlop** (1979), *Adjunct Associate Professor of Health Administration* — B.S., 1965 (California); M.A., 1969, Ph.D., 1973 (Michigan State)
- Michael F. Durfee** (1977), *Associate Professor of Pediatrics and Lecturer in Maternal and Child Health, School of Public Health* — B.A., 1959 (Ohio); M.D., 1963 (Virginia); M.P.H., 197 (The University of North Carolina at Chapel Hill)
- Jo Anne L. Earp** (1975), *Assistant Professor of Health Education* — B.A., 1965 (Bryn Mawr); Sc.D 1974 (Johns Hopkins)
- J. Wilbert Edgerton** (1965), *Professor of the Department of Psychiatry, School of Medicine and o Psychology, and Lecturer in Health Administration, School of Public Health* — B.S., 194 (Guilford); M.A., 1947 (Florida); Ph.D., 1953 (Duke)
- Elizabeth Merrill Edmands** (1967), *Associate Professor of Public Health Nursing, Emerita* (1979) — R.N., 1936 (Rhode Island Hospital); B.S.P.H.N., 1943 (Michigan); M.A., 1955 (Columbia)
- Joseph Chike Edozien** (1971), *Professor and Chairman of the Department of Nutrition* — B.Sc. 1948, M.Sc., 1950, M.B., B.Ch., 1951, M.D., 1954 (National University of Ireland); M.R.C.P. 1954, F.R.C.P., 1963 (Edinburgh); D.Sc., (Hon), 1963 (Rio de Janeiro); F.R.C.Path., 196 (England)
- Regina Cecylia Elandt-Johnson** (1964), *Professor of Biostatistics* — M.S., 1946 (University of Poznan, Poland); Ph.D., 1955 (Poznan Agricultural University)
- Robert Claude Elston** (1964), *Adjunct Professor in Biostatistics* — B.A., 1955, Dip.Ag., 1956, M.A. 1957 (Cambridge); Ph.D., 1959 (Cornell)
- Eugenia Eng** (1980), *Instructor in Health Education* — B.S., 1970 (University of Wisconsin) M.P.H., 1978 (The University of North Carolina at Chapel Hill)
- Bruce Lee Evatt** (1977), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — M.D., 1964 (Oklahoma)
- Marie Therese Fanelli** (1980), *Assistant Professor of Nutrition* — B.S., 1974 (Douglass College); M.S., 1977, Ph.D., 1979 (Rutgers University)
- Anita M. Farel** (1973), *Lecturer in Maternal and Child Health and Project Director at the Center for Early Adolescence* — A.B., 1966 (University of California at Berkeley); M.S.W., 1968 (University of California at Los Angeles); Dr.P.H., 1979 (The University of North Carolina at Chapel Hill)
- John J. Farmer III** (1973), *Adjunct Associate Professor of Parasitology and Laboratory Practice* — B.S., 1965 (Georgia Institute of Technology); Ph.D., 1968 (Georgia)
- MaryAnn C. Farthing** (1978), *Clinical Associate Professor of Nutrition* — B.S., 1954 (The North Carolina College for Women at Greensboro); M.S., 1957 (University of Tennessee); Ph.D., 1974 (The University of North Carolina at Greensboro)
- John C. Feely** (1968), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — A.A., 1953 (Los Angeles City College); A.B., 1955, Ph.D., 1958 (UCLA)
- Laurel A. Files** (1968), *Assistant Professor of Health Administration* — B.A., 1960 (Hofstra College); M.A., 1963 (Yale); Ph.D., 1978 (The University of North Carolina at Chapel Hill) On leave September 1, 1981 — June 30, 1982.
- William Shoemaker Flash** (1964), *Associate Professor of Health Administration, Clinical Associate Professor of Psychiatry, and Lecturer in Political Science* — A.B., 1948, M.P.A., 1950, Ph.D., 1954 (Harvard)
- Robert H. Fletcher** (1978), *Associate Professor of Medicine and Clinical Associate Professor of Epidemiology, School of Public Health* — B.A., 1962 (Wesleyan); M.D., 1966 (Harvard); M.Sc., 1973 (Johns Hopkins)
- Suzanne W. Fletcher** (1978), *Associate Professor of Medicine and Clinical Associate Professor of Epidemiology, School of Public Health* — B.A., 1962 (Swarthmore); M.D., 1966 (Harvard); M.S., 1973 (Johns Hopkins)
- John E. Forney** (1967), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.A., 1938 (Manchester); M.A., 1948, Ph.D., 1950 (Stanford)
- William A. Forsythe III** (1979), *Assistant Professor of Nutrition* — B.S., 1973, M.S.A., 1975 (University of Florida); Ph.D., 1980 (Michigan State University)

- John W. Foster** (1972), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1940 (Oklahoma); M.S., 1948, Ph.D., 1950 (Maryland)
- Donald Lee Fox** (1973), *Associate Professor of Air Hygiene in the Department of Environmental Sciences and Engineering* — B.S., 1965 (Wichita State); Ph.D., 1971 (Arizona State)
- Donald Edward Francisco** (1970), *Lecturer in the Department of Environmental Sciences and Engineering* — B.A., 1964, M.A., 1966 (North Texas State); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- David Allison Fraser** (1961), *Professor of Industrial Hygiene in the Department of Environmental Sciences and Engineering* — B.A., 1947 (Pennsylvania); M.S., 1956 (Xavier); Sc.D., 1961 (Cincinnati)
- Deborah A. Freund** (1979), *Assistant Professor of Health Administration* — A.B., 1972 (Washington University); M.P.H., 1974, M.A., 1975, Ph.D., 1980 (University of Michigan)
- Doyle Wicks Freymann** (1966), *Professor of Health Administration* — B.S., 1945 (Yale); M.D., 1948 (Johns Hopkins); M.P.H., 1956, Dr.P.H., 1960 (Harvard)
- Edward L. Frome** (1980), *Adjunct Assistant Professor of Biostatistics* — B.S., 1964, M.S., 1966 (University of Florida); Ph.D., 1972 (Emory University)
- John Hugh Fudenberg** (1977), *Adjunct Professor of Epidemiology* — A.B., 1949 (California); M.D., 1953 (Chicago); M.A., 1956 (Boston)
- Estelle M. Fulp** (1979), *Adjunct Associate Professor of Public Health Nursing* — Diploma in Nursing, 1944 (Braddock General Hospital, Penn.); B.S.P.H.N., 1962 (Duquesne); M.P.H., 1966 (The University of North Carolina at Chapel Hill)
- John T. Fulton** (1958), *Professor of Dental Epidemiology, Emeritus* (1971) — D.D.S., 1925 (Ohio State)
- Stephen H. Gehlbach** (1974), *Adjunct Assistant Professor of Epidemiology* — A.B., 1964 (Harvard); M.D., 1968 (Case Western Reserve); M.P.H., 1974 (The University of North Carolina at Chapel Hill)
- Rose Geraldine George** (1966), *Associate Professor of the School of Nursing Emerita and Assistant Professor Emerita, School of Public Health* (1980) — Dip. Nursing, 1941 (Massachusetts Memorial Hospital, Boston); R.N., B.S., 1951 (Wayne State); M.S., 1966 (The University of North Carolina at Chapel Hill)
- Benjamin Gilbert** (1982), *Clinical Assistant Professor of Health Administration* — B.G.S., 1972 (University of Michigan); M.P.H., 1976, J.D., 1979 (The University of North Carolina at Chapel Hill)
- Ernest Barry Gillings** (1971), *Professor of Biostatistics* — B.Sc., 1966 (Exeter); Dip. Math. Stat., 1967 (Cambridge); Ph.D., 1972 (Exeter)
- William Gold** (1979), *Assistant Professor of Environmental Sciences and Engineering* — B.A., 1963, Ph.D., 1969, M.S., 1973 (Harvard)
- Leonard J. Goldwater** (1970), *Adjunct Professor of Occupational Medicine in the Department of Environmental Sciences and Engineering* — A.B., 1924 (Michigan); M.D., 1928, Med.Sci.D., 1936 (New York); M.S.P.H., 1941 (Columbia)
- Wilton Thomas Goulson** (1957), *Professor of Parasitology and Laboratory Practice* — A.B., 1952 (Luther); M.S.P.H., 1953, Ph.D., 1957 (The University of North Carolina)
- Geraldine Gourley** (1963), *Associate Professor of Maternal and Child Health, Emeritus* (1980) — Ph.B., 1935 (Washburn); M.S.S.W., 1942 (Chicago)
- Ernest George Greenberg** (1949), *Kenan Professor of Biostatistics and Dean* — B.S., 1939 (College of the City of New York); Ph.D., 1949 (North Carolina State)
- Robert A. Greenberg** (1971), *Associate Professor of Pediatrics and Lecturer in Maternal and Child Health* — A.B., 1960 (Harvard); M.D., 1964 (Pennsylvania)
- Andrea B. Greene** (1978), *Adjunct Assistant Professor of Biostatistics* — B.A., 1971, M.S.P.H., 1972, Dr.P.H., 1977 (The University of North Carolina at Chapel Hill)
- Neil S. Grigg** (1978), *Adjunct Professor of Environmental Sciences and Engineering* — B.S., 1961 (U.S. Military Academy); M.S., 1965 (Auburn); Ph.D., 1969 (Colorado State)

- Roger Connell Grimson** (1976), *Associate Professor of Biostatistics* — B.S., 1964 (The University of North Carolina at Chapel Hill); Ph.D., 1969 (Duke)
- James Ennis Grizzle** (1960), *Professor and Chairman of Biostatistics* — B.S., 1951 (Berea College); M.S., 1953 (Virginia Polytechnic Institute); Ph.D., 1960 (North Carolina State)
- Charles T. Grubb** (1978), *Clinical Instructor in Health Administration* — B.A., 1969 (Gettysburg College); M.S.W., 1973 (The University of North Carolina at Chapel Hill)
- Priscilla Alden Guild** (1971), *Adjunct Instructor in Biostatistics* — B.S., 1966 (Wilson College); M.S.P.H., 1971 (The University of North Carolina at Chapel Hill)
- Frances Osborne Gust** (1962), *Assistant Professor of Health Administration, Emerita (1971)* — A.B., 1929 (Guilford); M.P.H., 1956 (North Carolina)
- Katherine M. Habib** (1977), *Adjunct Assistant Professor of Epidemiology* — B.A., 1961 (Duke University); M.P.H., 1975, Ph.D., 1978 (The University of North Carolina at Chapel Hill)
- Curtis G. Hames** (1978), *Clinical Professor of Epidemiology* — B.S., 1941, M.D., 1944 (University of Georgia)
- William H. Hannon** (1976), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1965 (Georgia State); Ph.D., 1972 (Tennessee)
- Ann Caton Hansen** (1958), *Associate Professor of Public Health Nursing, Emerita (1970)* — B.S., 1952 (Johns Hopkins); M.P.H., 1956 (North Carolina)
- Charles L. Harper** (1966), *Associate Dean and Associate Professor of Health Administration* — B.A., 1949, M.S.P.H., 1950 (The University of North Carolina); Ph.D., 1972 (The University of North Carolina at Chapel Hill)
- Frank E. Harrell, Jr.** (1980), *Adjunct Assistant Professor of Biostatistics* — B.S., 1973 (University of Alabama); Ph.D., 1979 (The University of North Carolina at Chapel Hill)
- Robert L. Harris, Jr.** (1973), *Professor of Environmental Engineering* — B.S.Ch.E., 1949 (Arkansas); M.S., 1954 (Harvard); Ph.D., 1972 (The University of North Carolina at Chapel Hill)
- James Ronald Hass** (1975), *Adjunct Associate Professor of Environmental Sciences and Engineering* — B.A., 1967 (Appalachian State); Ph.D., 1972 (The University of North Carolina at Chapel Hill)
- John W. Hatch** (1971), *Associate Professor of Health Education* — B.A., 1957 (Knoxville College); M.S.W., 1959 (Atlanta); Dr.P.H., 1974 (The University of North Carolina at Chapel Hill)
- Charles L. Hatheway** (1979), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.Sc., 1957, M.Sc., 1961, Ph.D., 1964 (Ohio State)
- Carl G. Hayes** (1969), *Adjunct Associate Professor of Epidemiology* — B.S., 1955 (Mercer); M.P.H., 1963, Ph.D., 1969 (The University of North Carolina at Chapel Hill)
- Suzanne G. Haynes** (1975), *Research Assistant Professor of Epidemiology* — B.A., 1969 (University of Tennessee); M.A., 1970, M.P.H., 1972 (University of Texas); Ph.D., 1975 (The University of North Carolina at Chapel Hill)
- Milton Sydney Heath, Jr.** (1957), *Professor of Public Law and Government and Professor of Water Resources in the Department of Environmental Sciences and Engineering* — A.B., 1941 (Harvard); LL.B., 1952 (Columbia)
- Gerardo Heiss** (1976), *Research Associate Professor of Epidemiology* — M.D., 1968 (Chile); M.Sc.S.M., 1973 (London); Ph.D., 1976 (The University of North Carolina at Chapel Hill)
- Ronald William Helms** (1968), *Associate Professor of Biostatistics* — B.A., 1963, M.A., 1966 (Tennessee); Ph.D., 1969 (North Carolina State University)
- James Richard Hendricks** (1949), *Associate Professor of Parasitology and Laboratory Practice* — B.S., 1940 (Guilford); M.S., 1948, Ph.D., 1951 (The University of North Carolina)
- O. Marie Henry** (1981), *Adjunct Associate Professor of Public Health Nursing* — B.S.N., 1964 (University of Virginia); M.S.N., 1971, D.N.S.C., 1975 (The Catholic University of America)
- William Theodore Herzog** (1964), *Associate Professor of Health Administration* — B.A., 1951 (Knox College); M.S.P.H., 1958 (North Carolina)
- Siegfried H. Heyden** (1967), *Adjunct Professor of Epidemiology* — M.D., 1951 (University of Berlin); Ph.D., 1966 (University of Zurich)

- John L. S. Hickey** (1979), *Research Associate Professor of Air and Industrial Hygiene in the Department of Environmental Sciences and Engineering* — B.S.C.E., 1948 (Texas Tech); M.S.S.E., 1949 (Harvard); M.S.P.H., 1974, Ph.D., 1977 (The University of North Carolina at Chapel Hill)
- Marion E. Highriter** (1968), *Associate Professor of Public Health Nursing and Lecturer in Nursing* — B.A., 1950 (Mount Holyoke); M.N., 1953 (Yale); M.P.H., 1958, D.Sc., 1969 (Harvard)
- Martin Patterson Hines** (1959), *Adjunct Associate Professor of Health Administration* — D.V.M., 1946 (Ohio State); M.P.H., 1949 (Harvard)
- Godfrey Hochbaum** (1972), *Professor of Health Education* — B.A., 1947 (American University); M.A., 1949 (George Washington University); Ph.D., 1953 (Minnesota)
- David Gerhard Hoel** (1971), *Adjunct Professor of Biostatistics* — A.G., 1961 (UCLA); Ph.D., 1966 (The University of North Carolina)
- Michael Hogan** (1975), *Adjunct Assistant Professor of Epidemiology* — B.A., 1960 (DePauw); M.S., 1964, M.P.H., 1965, Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Harold D. Holder**, *Lecturer in Health Administration* — A.B., 1961 (Stanford University); M.A., 1962, Ph.D., 1965 (Syracuse University) Deceased
- Lydia Say Holley** (1969), *Associate Professor of Health Administration* — A.B., 1948 (Coker College); Cert.P.T., 1950 (Duke); M.P.H., 1961 (North Carolina) Deceased, April 19, 1981.
- Joseph L. Holliday** (1977), *Adjunct Assistant Professor of Maternal and Child Health* — A.B., 1969 (The University of North Carolina at Chapel Hill); M.D., 1973 (Vanderbilt); M.P.H., 1975 (The University of North Carolina at Chapel Hill)
- William Gray Hollister** (1965), *Professor of Psychiatry and Lecturer, Department of Health Administration, School of Public Health Emeritus (1980)* — A.B., 1937, B.S., 1940, M.D., 1941 (Nebraska); M.P.H., 1947 (Johns Hopkins).
- Daniel Goodman Horvitz** (1973), *Adjunct Professor of Biostatistics* — B.S., 1943 (Massachusetts); Ph.D., 1953 (Iowa State)
- James D. Hosking** (1980), *Assistant Professor of Biostatistics* — B.S., 1974 (Georgia Institute of Technology); M.A., 1978, Ph.D., 1980 (University of North Carolina at Chapel Hill)
- Richard M. House** (1980), *Clinical Assistant Professor, Health Education* — B.S., 1963 (East Carolina University); M.P.H., 1969 (The University of North Carolina at Chapel Hill)
- David H. Howells** (1967), *Professor of Environmental Engineering in the Department of Environmental Sciences and Engineering Emeritus (1976)* — B.S.C.E., 1949 (Oregon State); M.S.S.E., 1955 (Massachusetts Institute of Technology)
- Dorothy C. Howze** (1981), *Assistant Professor of Maternal and Child Health* — B.A., 1969 (Bennett College); M.S.W., 1972 (University of Pittsburgh); M.P.H., 1974, Dr.P.H., 1980 (Harvard University)
- Cathee J. Huber** (1973), *Assistant Professor of Nursing, School of Nursing and Lecturer in Maternal and Child Health, School of Public Health* — B.S.N., 1964 (Michigan); M.N., 1966 (University of Washington)
- Maynard Michael Hufschmidt** (1965), *Professor of City and Regional Planning and Professor of Environmental Sciences and Engineering, Emeritus (1979)* — B.S., 1939 (Illinois); M.P.A., 1955, D.P.A., 1964 (Harvard).
- Barbara Ann Hughes** (1979), *Adjunct Associate Professor of Nutrition* — B.S., 1960 (Carson-Newman College); M.S., 1963 (Ohio State University); M.R.E., 1968 (Southern Baptist Theological Seminary); M.P.H., 1972 (The University of North Carolina at Chapel Hill)
- John Thomas Hughes** (1960), *Professor of Health Administration, School of Public Health and Professor of Ecology, School of Dentistry* — B.S., 1940 (Wake Forest); D.D.S., 1947 (Maryland); M.P.H., 1958, Dr.P.H., 1962 (The University of North Carolina)
- Barbara S. Hulka** (1967), *Professor of Epidemiology, and Clinical Associate Professor of Family Medicine* — B.A., 1952 (Radcliffe); M.S., 1954 (Juilliard School of Music); M.D., 1959, M.P.H., 1961 (Columbia)
- Jaroslav Fabian Hulka** (1966), *Professor of Obstetrics and Gynecology, School of Medicine and Maternal and Child Health, School of Public Health* — B.S., 1952 (Harvard); M.D., 1956 (Columbia)

- Joan Cornoni Huntley** (1966), *Adjunct Associate Professor of Epidemiology* — B.A., 1953 (Marshall University); M.P.H., 1952 (North Carolina); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Michel A. Ibrahim** (1969), *Professor and Chairman of Epidemiology* — M.D., 1957 (Cairo); M.P.H., 1961 (The University of North Carolina); Ph.D., 1964 (The University of North Carolina at Chapel Hill)
- Lois Simmons Isler** (1977), *Adjunct Assistant Professor of Public Health Nursing* — B.S.N., 1966 (Hampton Institute); M.P.H., 1971, Cert.F.N.P., 1972 (The University of North Carolina at Chapel Hill)
- Raymond Isley** (1977), *Adjunct Assistant Professor of Health Education* — B.A., 1957 (Taylor); M.D., 1961 (Washington); M.P.H., 1971 (The University of North Carolina at Chapel Hill)
- Howard Newman Jacobson** (1978), *Director of Institute of Nutrition and Clinical Professor of Maternal and Child Health* — B.Sc., 1947, B.M., 1950, M.D., 1951 (Northwestern University Medical School)
- Sagar C. Jain** (1965), *Professor and Chairman of Health Administration, School of Public Health, and Clinical Professor of Administration in the Department of Psychiatry, School of Medicine* — B.A., 1950, M.A., 1952 (Delhi); A.M., 1960 (Illinois); Ph.D., 1964 (Cornell)
- Joseph M. Janis** (1981), *Research Assistant Professor of Biostatistics* — B.S., 1957, B.M.S., 1971 (University of Pittsburgh); Classical A.B., 1967 (St. Louis University); M.S.P.H., 1977, Dr.P.H., 1981 (University of North Carolina at Chapel Hill)
- Sherman A. James** (1973), *Associate Professor of Epidemiology and Clinical Associate Professor of Psychology* — A.B., 1964 (Talladega College, Alabama); Ph.D., 1973 (Washington University)
- Harvey Edward Jeffries** (1970), *Associate Professor of Air Hygiene in the Department of Environmental Sciences and Engineering* — B.S., 1964 (Florida Presbyterian); M.S.P.H., 1967, Ph.D., 1971 (The University of North Carolina at Chapel Hill)
- William F. Jessee** (1980), *Associate Professor of Health Administration and Social and Administrative Medicine* — A.B., 1968 (Stanford University); M.D., 1972 (University of California at San Diego)
- J. Donald Johnson** (1961), *Professor of Environmental Chemistry in the Department of Environmental Sciences and Engineering* — B.S., 1957 (UCLA); Ph.D., 1962 (The University of North Carolina)
- Nancy L. Johnson** (1979), *Adjunct Assistant Professor of Nutrition* — B.S., 1958 (University of New Hampshire); M.P.H., 1976 (The University of North Carolina at Chapel Hill)
- Norman James Johnson** (1978), *Assistant Professor of Biostatistics* — B.A., 1965, M.A., 1967 (Oregon); M.Phil., 1970, Ph.D., 1974 (Yale)
- Richard Eugene Johnston** (1973), *Associate Professor of Radiology and Adjunct Associate Professor in the Department of Environmental Sciences and Engineering* — B.S., 1956 (Akron); M.S., 1958, Ph.D., 1968 (Vanderbilt)
- Daniel C. Jones** (1975), *Lecturer in Health Administration* — M.E., 1944, E.E., 1945 (British Royal Academy); J.D., 1960 (Youngstown)
- Wallis L. Jones** (1977), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — A.B., 1957 (Emory); M.S., 1966, Ph.D., 1968 (Georgia)
- William Dean Kalsbeek** (1978), *Assistant Professor of Biostatistics* — B.A., 1968 (Northwestern College, Iowa); M.P.H., 1970, Ph.D., 1973 (Michigan)
- Arnold Daniel Kaluzny** (1967), *Professor of Health Administration* — B.S., 1960 (Wisconsin); M.H.A., 1962, Ph.D., 1967 (Michigan)
- Kandiah Kanagaratnam** (1980), *Adjunct Professor of Health Administration* — M.B.B.S., 1952, D.P.H., 1956 (University of Malaya)
- Berton H. Kaplan** (1960), *Professor of Epidemiology* — B.S., 1951 (Virginia Polytechnic Institute); M.S., 1952, Ph.D., 1962 (The University of North Carolina)
- William Kaplan** (1968), *Adjunct Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1943, D.V.M., 1946 (Cornell); M.P.H., 1951 (Minnesota)

- ohn Marshall Karon** (1980), *Research Associate Professor* — B.A., 1963 (Carleton College); M.S., 1965, Ph.D., 1968 (Stanford University)
- leo Kaufman** (1965), *Adjunct Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1952 (Brooklyn); M.S., 1955, Ph.D., 1958 (Kentucky)
- Mildred Kaufman** (1977), *Associate Professor of Nutrition* — B.S., 1947 (Simmons College); M.S., 1952 (Columbia University Teachers College)
- Alan P. Kendal** (1979), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1966 (London, England); Ph.D., 1968 (University College Hospital Medical School)
- Rosemary Kent** (1951), *Associate Professor in Health Education, Emerita* (1972) — A.B., 1933 (Agnes Scott College); M.A., 1934 (Emory University); M.P.H., 1946, Ph.D., 1949 (The University of North Carolina)
- Mildred A. Kerbaugh** (1977), *Adjunct Associate Professor of Parasitology and Laboratory Practice* — B.S., 1949 (Wake Forest); M.S., 1968 (North Carolina State)
- John C. Key** (1971), *Adjunct Assistant Professor of Health Education* — B.S., 1963 (North Carolina State); M.S.P.H., 1964 (The University of North Carolina at Chapel Hill); M.S.W., 1970, Ph.D., 1972 (Brandeis)
- David G. Kleinbaum** (1970), *Associate Professor of Biostatistics and Epidemiology* — A.B., 1962 (Hamilton); A.M., 1964 (Rochester); Ph.D., 1970 (The University of North Carolina at Chapel Hill). On leave August 1, 1981 - July 31, 1982.
- James D. Knoke** (1978), *Associate Professor of Biostatistics* — B.A., 1963 (University of Iowa); M.S., 1965 (Stanford University); Ph.D., 1970 (University of California, Los Angeles)
- Edna H. Knott** (1972), *Adjunct Instructor in Parasitology and Laboratory Practice* — B.S., 1960 (The University of North Carolina); M.P.H., 1968 (The University of North Carolina at Chapel Hill)
- Gary Grove Koch** (1967), *Professor of Biostatistics* — B.S., 1962, M.S., 1963 (Ohio State); Ph.D., 1968 (The University of North Carolina at Chapel Hill)
- Thomas Robert Konrad** (1978), *Research Assistant Professor of Dental Ecology and Health Services Research, School of Dentistry and Adjunct Assistant Professor of Health Administration, School of Public Health* — B.A., 1966 (Santa Clara); M.A., 1970, Ph.D., 1975 (The University of North Carolina at Chapel Hill)
- Jacob Koomen, Jr.** (1959), *Clinical Professor of Health Administration* — B.S., 1939, M.D., 1945 (Rochester); M.P.H., 1957 (The University of North Carolina)
- Jonathan Bruce Kotch** (1978), *Assistant Professor of Maternal and Child Health* — B.A., 1968 (Columbia College); M.D., 1973 (Stanford University); B.A., 1974 (Cambridge); M.P.H., 1977 (The University of North Carolina at Chapel Hill); M.A., 1978 (Cambridge)
- Joyce Kramer** (1979), *Assistant Professor in Health Education* — A.B., 1963 (University of Colorado); M.A., 1973 (University of Washington); Ph.D., 1980 (The University of North Carolina at Chapel Hill)
- Alan K. Kronhaus** (1981), *Clinical Assistant Professor of Health Administration, and Clinical Instructor of Medicine* — B.A., 1970 (Boston University); M.D., 1972 (Boston University Medical School)
- Roy Raymond Kuebler, Jr.** (1958), *Professor of Biostatistics, Emeritus* (1976); *Lecturer in Biostatistics* — A.B., 1933 (Dickinson); A.M., 1947 (Pennsylvania); Ph.D., 1958 (The University of North Carolina)
- Edward J. Kuenzler** (1965), *Professor of Environmental Biology in the Department of Environmental Sciences and Engineering* — B.S., 1951 (Florida); M.S., 1953, Ph.D., 1959 (Georgia)
- Lawrence Louis Kupper** (1970), *Professor of Biostatistics* — B.S., 1961 (Maryland); M.S., 1965 (Florida); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- James C. Lamb, III** (1959), *Professor of Sanitary Engineering in the Department of Environmental Sciences and Engineering* — B.S.C.E., 1947 (Virginia Military Institute); M.S., 1948, S.E., 1952, Sc.D., 1953 (Massachusetts Institute of Technology)
- John Edgar Larsh, Jr.** (1943), *Professor of Parasitology and Laboratory Practice, Emeritus* (1981) — B.A., 1939, M.S., 1940 (Illinois); Sc.D., 1943 (Johns Hopkins)

- Donald Thomas Lauria** (1965), *Professor of Environmental Engineering in the Department of Environmental Sciences and Engineering* — B.C.E., 1956 (Manhattan); M.S.S.E., 1965 (Syracuse); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Therese P. Lawler** (1977), *Adjunct Assistant Professor of Public Health Nursing* — B.S.N., 1957 (Georgetown); M.S., 1972 (East Carolina)
- Kerry Lamont Lee** (1975), *Adjunct Associate Professor of Biostatistics* — B.S., 1965 (Utah); M.S. (Stanford); Ph.D., 1975 (The University of North Carolina at Chapel Hill)
- Judith T. Lessler** (1981), *Adjunct Assistant Professor of Biostatistics* — B.A., 1966 (The University of North Carolina at Chapel Hill); M.A.T., 1967 (Emory University); Ph.D., 1974 (The University of North Carolina at Chapel Hill)
- Ronald H. Levine** (1980), *Adjunct Associate Professor of Health Administration* — B.S., 1965 (Union College); M.D., 1959 (State University of New York); P.H., 1967 (The University of North Carolina at Chapel Hill)
- Forrest E. Linder** (1967), *Professor of Biostatistics, Emeritus* (1977) — B.A., 1930, M.A., 1931, Ph.D., 1932 (State University of Iowa)
- Joan Scheff Lipsitz** (1978), *Clinical Assistant Professor in Maternal and Child Health and Director of Center for Early Adolescence* — B.A., 1959 (Wellesley College); M.A., 1964 (Connecticut); Ph.D., 1976 (The University of North Carolina at Chapel Hill)
- Linda West Little** (1971), *Adjunct Associate Professor of Environmental Biology in the Department of Environmental Sciences and Engineering* — B.A., 1959 (Woman's College, North Carolina); M.S.P.H., 1962 (The University of North Carolina); Ph.D., 1968 (The University of North Carolina at Chapel Hill)
- Frank Aloysius Loda, Jr.** (1967), *Professor of Pediatrics and Lecturer in Maternal and Child Health* — A.B., 1956 (Harvard); M.D., 1960 (Vanderbilt)
- Robert A. Loddengaard** (1972), *Clinical Associate Professor of Health Administration* — B.E.E., 1949 (City College of New York); M.S.P.H., 1971 (The University of North Carolina at Chapel Hill)
- Gory J. Love** (1973), *Research Associate Professor of Epidemiology* — B.S., 1949 (Georgia); M.P.H., 1959, D.Sc., 1961 (Pittsburgh)
- James W. Luckey** (1980), *Clinical Assistant Professor of Health Administration* — B.A., 1972 (University of Colorado); Ph.D., 1978 (University of Nebraska-Lincoln)
- John C. Lumsden** (1980), *Adjunct Professor of Environmental Sciences and Engineering* — B.S., 1947 (North Carolina State University)
- Anders S. Lunde** (1968), *Adjunct Professor of Biostatistics* — B.A., 1938 (St. Lawrence); M.A., 1947, Ph.D., 1955 (Columbia)
- Clarence C. Lushbaugh** (1980), *Adjunct Professor of Epidemiology* — B.S., 1939, Ph.D., 1942, M.D., 1948 (University of Chicago)
- John Newton MacCormack** (1979), *Adjunct Associate Professor of Epidemiology* — B.A., 1958 (Duke); M.D., 1962 (The University of North Carolina); M.P.H., 1968 (The University of North Carolina at Chapel Hill)
- Donald Lewis Madison** (1969), *Associate Professor of Social and Administrative Medicine and Family, School of Medicine and Associate Professor of Health Administration, School of Public Health* — B.Mus.Ed., 1958 (La Sierra); M.D., 1965 (Loma Linda)
- Malcolm Alan Martin** (1981), *Adjunct Associate Professor, Parasitology and Laboratory Practice (Field)* — A.A., 1957 (George Washington University); M.D., 1962 (Yale University)
- William Fred Mayes** (1963), *Professor of Health Administration and Dean, Emeritus* (1973) — B.S., 1936, M.D., 1938 (Kansas); M.P.H., 1948 (Harvard)
- Eugene S. Mayer** (1971), *Professor of Family Medicine and Medicine; Associate Dean, School of Medicine; Director of Area Health Education Centers Program and Adjunct Associate Professor of Epidemiology, School of Public Health* — B.S., 1960 (Tufts); M.D., 1964 (Columbia); M.P.H., 1971 (Yale)
- Nancy McCharen** (1978), *Clinical Assistant Professor of Health Education* — B.A., 1971, M.P.H., 1977 (The University of North Carolina at Chapel Hill)

- Joseph McCormick** (1981), *Adjunct Associate Professor of Parasitology and Laboratory Practice* — B.S., 1964, (Florida Southern College); M.S., 1970, (Harvard University); M.D., 1971 (Duke University)
- Marie Justin McIntyre** (1967), *Associate Professor of Public Health Nursing, Emerita* (1980) — B.S., 1950, M.S., 1952 (Syracuse); M.S., 1962 (Harvard)
- Robert W. McKinney** (1981), *Adjunct Associate Professor of Parasitology and Laboratory Practice* — B.S., 1947 (Indiana State University); M.S., 1949 (New York University); Ph.D., 1956 (University of Michigan)
- Curtis P. McLaughlin** (1968), *Professor of Business Administration and Health Administration and Coordinator of Operations Management and Quantitative Methods, School of Business Administration* — B.A., 1954 (Wesleyan); M.B.A., 1956, D.B.A., 1966 (Harvard)
- Helen Jo McNeil** (1980), *Adjunct Associate Professor of Public Health Nursing* — B.S., 1947 (Seattle University); M.N., 1961 (University of Washington)
- Melinda S. Meade** (1978), *Assistant Professor of Geography and Adjunct Assistant Professor of Epidemiology* — B.A., 1966 (Hofstra); M.A., 1970 (Michigan State); Ph.D., 1974 (Hawaii)
- Nancy Milio** (1976), *Professor of Nursing, School of Nursing and Professor of Health Administration, School of Public Health* — B.S., 1960, M.A., 1965 (Wayne State); Ph.D., 1970 (Yale)
- C. Arden Miller** (1966), *Professor and Chairman of Maternal and Child Health, School of Public Health and Professor of Pediatrics, School of Medicine* — M.D., 1948 (Yale)
- David S. Millington** (1981), *Research Associate Professor of Environmental Sciences and Engineering* — B.Sc., 1966, Ph.D., 1969 (University of Liverpool, England)
- Kenneth C. Mills** (1973), *Associate Professor of Psychiatry and Research Associate Professor of Psychology* — B.A., 1966, M.S., 1967 (California, Long Beach); Ph.D., 1970 (Claremont)
- Lucille F. Minuto** (1980), *Adjunct Instructor in Health Education* — B.S., 1969, M.Ed., 1978 (University of Rhode Island)
- Forest O. Mixon** (1972), *Adjunct Professor of Environmental Engineering in the Department of Environmental Sciences and Engineering* — B.S., 1952, M.S., 1954 (North Carolina State University); Ph.D., 1958 (Delaware)
- Beatrice Bell Mongeau** (1962), *Associate Professor of Public Health Nursing, Emerita* (1978) — B.S., 1955, M.P.H., 1956 (The University of North Carolina); Ph.D., 1973 (The University of North Carolina at Chapel Hill)
- Max D. Moody** (1966), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — A.B., 1948, M.A., 1949, Ph.D., 1953 (Kansas)
- Robert Burns Moorhead** (1967), *Lecturer in Health Administration and Associate Dean* — B.A., 1954 (North Carolina); M.P.A., 1972 (The University of North Carolina at Chapel Hill)
- Merry K. Moos** (1978), *Clinical Instructor in Maternal and Child Health* — B.S.N., 1970 (Washington); M.P.H., 1978 (The University of North Carolina at Chapel Hill)
- David Humphreys Moreau** (1968), *Professor of City and Regional Planning and of Environmental Sciences and Engineering and Associate Dean of Arts and Sciences* — B.S., 1960 (Mississippi State); M.S., 1963 (The University of North Carolina at Chapel Hill); Ph.D., 1967 (Harvard)
- Lucy Shields Morgan** (1942), *Professor of Health Education, Emerita* (1966) — A.B., 1922 (Tennessee); M.A., 1929 (Columbia); M.S., 1932 (Tennessee); Ph.D., 1938 (Yale)
- Sarah Taylor Morrow** (1968), *Adjunct Professor of Maternal and Child Health* — B.S., 1942 (The University of North Carolina); M.D., 1944 (Maryland); M.P.H., 1960 (The University of North Carolina)
- Michael J. Moser** (1981), *Adjunct Assistant Professor of Epidemiology* — B.S., 1969 (University of Dayton); M.D., 1977 (University of Kentucky); M.P.H., 1980 (The University of North Carolina at Chapel Hill)
- Claude W. Moss** (1972), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1957, M.S., 1962 (North Carolina State); Ph.D., 1965 (North Carolina State at Raleigh)

- Keith Eldon Muller** (1978), *Research Assistant Professor in Biostatistics* — B.S., 1970, M.A., 1971 (Bradley University); Ph.D., 1976, M.S., 1981 (The University of North Carolina at Chapel Hill)
- Eric B. Munson** (1980), *Adjunct Assistant Professor of Social and Administrative Medicine and General Director, North Carolina Memorial Hospital* — B.A., 1965 (Wabash College); M.B.A., 1967 (University of Chicago)
- Kadambari K. Namboodiri** (1969), *Research Associate Professor of Biostatistics* — B.S., 1949, M.S., 1951 (University College India); Ph.D., 1963 (Michigan)
- George Marvin Neely** (1977), *Assistant Professor of Health Administration* — B.A., 1970 (Puget Sound); Ph.D., 1976 (Michigan)
- Virginia Margaret Nelson** (1960), *Associate Professor of Public Health Nursing* — B.A., 1946 (Stanford); B.S., 1949 (Minnesota); M.P.H., 1955 (Pittsburgh) Deceased, March 21, 1981.
- William C. Nelson** (1969), *Adjunct Associate Professor of Biostatistics* — B.S., 1961 (Wake Forest); M.S., 1964, Ph.D., 1967 (Virginia Polytechnic Institute)
- M. Nizamuddin** (1979), *Research Assistant Professor in Biostatistics* — M.A., 1965 (University of Karachi, Pakistan); M.A., 1969 (University of Chicago); Ph.D., 1979 (University of Michigan) On leave October 1, 1981 - September 30, 1982.
- Frederic W. Nordsiek** (1975), *Adjunct Professor of Nutrition* — B.S., 1931 (Massachusetts Institute of Technology); M.S., 1959 (New York University); Ph.D., 1961 (Columbia University)
- Richard R. Nugent** (1978), *Adjunct Assistant Professor of Maternal and Child Health* — B.A., 1962 (Amherst); M.D., 1966 (Pennsylvania); M.P.H., 1974 (The University of North Carolina at Chapel Hill)
- James P. O'Connell** (1981), *Adjunct Assistant Professor, Parasitology and Laboratory Practice* — B.S., 1968 (Virginia Polytechnic Institute); M.P.H., 1975, Dr.P.H., 1977 (The University of North Carolina at Chapel Hill)
- Charles R. O'Melia** (1966), *Adjunct Professor of Environmental Sciences and Engineering* — B.C.E., 1955 (Manhattan); M.S.E., 1956, Ph.D., 1963 (Michigan)
- John F. Obijeski** (1975), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.A., 1964 (Connecticut); M.S., 1971, Ph.D., 1971 (Rutgers)
- Horace Ogden** (1982), *Adjunct Professor of Health Education* — A.B., 1947 (Depauw University); M.S., 1949 (Auburn University)
- Charles H. Okey** (1976), *Clinical Associate Professor of Parasitology and Laboratory Practice* — A.B., 1936 (Arkansas State); M.S., 1943 (Tennessee); Ph.D., 1950 (Yale)
- Daniel Alexander Okun** (1952), *Kenan Professor of Environmental Engineering in the Department of Environmental Sciences and Engineering* — B.S.C.E., 1937 (Cooper Union); M.S.C.E., 1938 (California Institute of Technology); Sc.D., 1948 (Harvard)
- Abdel R. Omran** (1966), *Professor of Epidemiology* — M.D., 1952, D.P.H., 1954 (Cairo); M.P.H., 1956, Dr.P.H., 1959 (Columbia)
- Khairia F. Omran** (1979), *Adjunct Associate Professor of Maternal and Child Health* — M.D., 1957 (Cairo University); M.P.H., 1959, Dr.P.H., 1965 (Columbia University)
- Marcia G. Ory** (1976), *Adjunct Assistant Professor of Health Education* — B.A., 1971 (Texas); M.A., 1973 (Indiana); Ph.D., 1976 (Purdue)
- James W. Osberg** (1968), *Adjunct Professor in Health Administration* — M.D., 1948 (Tufts University Medical School)
- Charlene C. Ossler** (1981), *Clinical Assistant Professor of Public Health Nursing* — B.S.N., 1972 (University of Maryland); M.S.N., 1976 (Catholic University of America); M.P.H., 1979 (Johns Hopkins)
- Athos Ottolenghi** (1979), *Adjunct Professor of Parasitology and Laboratory Practice (Field)* — M.D., 1946 (Pavia Medical School, Italy)
- Erskine L. Palmer** (1973), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1962, M.S., 1964 (Florida State); Ph.D., 1970 (Mississippi)

- Jarnett R. Parker** (1977), *Assistant Professor of Health Administration* — B.S., 1966, M.S., 1972, Ph.D., 1976 (Rochester)
- George R. Parkerson, Jr.** (1977), *Adjunct Assistant Professor of Epidemiology* — B.S., 1953, M.D., 1953 (Duke); M.P.H., 1977 (The University of North Carolina at Chapel Hill)
- Ralph Clinton Patrick, Jr.** (1958), *Associate Professor of Epidemiology and Senior Faculty Associate in Anthropology* — A.B., 1946 (The University of North Carolina); M.A., 1952, P.D., 1954 (Harvard)
- Mary D. Peoples** (1981), *Associate Professor of Maternal and Child Health* — B.S.N., 1969 (St. John College); M.S., 1973 (Boston University); Dr.P.H., 1981 (The University of North Carolina at Chapel Hill)
- FredERIC K. Pfaender** (1971), *Associate Professor of Environmental Microbiology in the Department of Environmental Sciences and Engineering* — B.S., 1966, M.S., 1968 (California State); Ph.D., 1971 (Cornell)
- Ed. Briggs Phillips** (1978), *Adjunct Professor of Parasitology and Laboratory Practice* — B.S., 1954 (Maryland); Ph.D., 1965 (New York)
- Harry T. Phillips** (1969), *Professor of Health Administration, School of Public Health and Professor of Social and Administrative Medicine, School of Medicine* — M.B., 1938, Ch.B., 1938, D.P.H., 1953, M.D., 1956 (Cape Town, S. Africa)
- Leo Pine** (1965), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1943 (Arizona); M.S., 1948 (Wisconsin); Ph.D., 1952 (California)
- Warren T. Piver** (1977), *Adjunct Associate Professor of Environmental Sciences in the Department of Environmental Sciences and Engineering* — B.S., 1963 (Duke); B.S.Ch.E., 1965, M.S.Ch.E., 1970, Ph.D., 1972 (North Carolina State University at Raleigh)
- Margaret B. Pollard** (1975), *Clinical Assistant Professor in Health Education* — B.S., 1954, M.S., 1958 (North Carolina Central)
- Barry M. Popkin** (1977), *Associate Professor of Nutrition* — B.S., 1967, M.S., 1969 (University of Wisconsin); Ph.D., 1974 (Cornell University)
- Marva M. Price** (1977), *Adjunct Instructor in Nursing and Lecturer in Maternal and Child Health* — B.S.N., 1972 (North Carolina A & T); R.N.; M.P.H., 1974 (The University of North Carolina at Chapel Hill)
- Samuel M. Putnam** (1970), *Assistant Professor of Medicine and Adjunct Assistant Professor of Epidemiology* — B.A., 1960, M.D., 1964, M.P.H., 1970 (Harvard)
- Dana Edward Anthony Quade** (1962), *Professor of Biostatistics and Associate Dean for Graduate Programs* — B.A., 1955 (UCLA); Ph.D., 1960 (The University of North Carolina)
- Madhav B. Ranade** (1981), *Adjunct Associate Professor of Environmental Sciences and Engineering* — B. Tech., 1964 (Nagpur University, India); M.S., 1968, Ph.D., 1974 (Illinois Institute of Technology)
- Komal V. Ranganathan** (1980), *Adjunct Professor of Health Administration* — M.B.B.S., 1951, B.S.Sc., 1958 (University of Madras-India); M.P.H., 1962 (University of California)
- John Kain Read** (1972), *Associate Professor of Parasitology and Laboratory Practice* — B.S., 1948 (American University); M.S., 1949, Ph.D., 1968 (Chicago)
- Margaret LaVerne Reid** (1981), *Adjunct Instructor of Health Education* — B.S., 1971 (North Carolina Central University); M.P.H., 1976 (University of North Carolina at Chapel Hill)
- Charles B. Reimer** (1979), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1949, M.S., 1949 (Massachusetts Institute of Technology); Ph.D., 1957 (Johns Hopkins)
- Daniel B. Reimer** (1980), *Lecturer in Health Administration* — B.S., 1967 (University of Wisconsin); M.P.H., 1974 (The University of North Carolina at Chapel Hill)
- Donald W. Reinfurt** (1978), *Adjunct Associate Professor in Biostatistics* — B.S., 1960 (State University of New York at Albany); M.A., 1963 (State University of New York at Buffalo); Ph.D., 1970 (North Carolina State University at Raleigh)
- Errol Reiss** (1978), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — Ph.D., 1972 (Rutgers); B.Sc., 1973 (City College of New York)

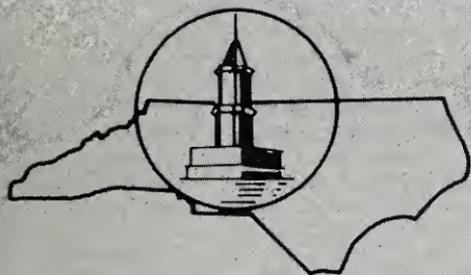
- Parker Cramer Reist** (1972), *Professor of Air and Industrial Hygiene Engineering in the Department of Environmental Sciences and Engineering* — B.S., 1955 (Pennsylvania State); S.M., 1957 (Massachusetts Institute of Technology); S.M., 1963, Sc.D., 1966 (Harvard)
- Jimmie L. Rhyne** (1951), *Adjunct Instructor in Maternal and Child Health* — B.A., 1944 (North Carolina); M.D., 1948 (University of Maryland, School of Medicine); M.P.H., 1958 (North Carolina)
- Wilson B. Riggan** (1969), *Adjunct Associate Professor of Biostatistics* — B.S., 1950 (Virginia Polytechnic Institute); Ph.D., 1966 (North Carolina State University at Raleigh)
- Emily James Rivenbark** (1979), *Adjunct Instructor of Public Health Nursing and Nursing* — B.S.N., 1973 (East Carolina University)
- Doris Emma Roberts** (1975), *Adjunct Professor of Public Health Nursing* — Dip. in Nursing, 1938 (Peter Bent Brigham School of Nursing); B.S., 1944 (Geneva College); M.P.H., 1958 (Minnesota); Ph.D., 1967 (The University of North Carolina at Chapel Hill)
- Walter J. Rogan** (1977), *Adjunct Assistant Professor of Epidemiology* — B.A., 1971 (LaSalle); M.P.H., 1975, M.D., 1975 (California)
- Hugo H. Rogers, Jr.** (1978), *Adjunct Associate Professor of Environmental Sciences and Engineering* — B.S., 1969, M.S., 1971 (Auburn); Ph.D., 1975 (The University of North Carolina at Chapel Hill)
- Franz Weston Rosa** (1966), *Adjunct Professor of Maternal and Child Health* — B.S., 1944 (North Carolina); M.D., 1948 (Harvard); M.P.H., 1958 (California)
- Leonard S. Rosenfeld** (1972), *Professor of Health Administration* — B.S., 1933, M.D., 1937 (New York University); M.P.H., 1942 (Johns Hopkins)
- Charles John Rothwell** (1977), *Adjunct Instructor of Biostatistics* — B.S., 1966 (Virginia Military Institute); M.B.A., 1968 (Maryland); M.S., 1974 (The University of North Carolina at Chapel Hill)
- Richard Gary Rozier** (1976), *Research Assistant Professor of Health Administration* — A.B., 1966 (Wake Forest); D.D.S., 1970, M.P.H., 1976 (The University of North Carolina at Chapel Hill)
- Seth A. Rudnick** (1978), *Assistant Professor of Medicine and Adjunct Assistant Professor of Epidemiology* — B.A., 1969 (Pennsylvania); M.D., 1974 (Virginia)
- Nadine H. Rund** (1971), *Adjunct Associate Professor of Health Education* — B.A., 1960 (Southern Illinois); Ph.D., 1966 (Cornell)
- Eric Brandfon Sansone** (1981), *Adjunct Associate Professor, Parasitology and Laboratory Practice* — B.Ch.E., 1960 (City College of New York); M.P.H., 1962, Ph.D., 1967 (University of Michigan)
- Earl S. Schaefer** (1971), *Professor of Maternal and Child Health* — B.S., 1948 (Purdue University); M.A., 1951, Ph.D., 1954 (Catholic University of America)
- Morris Schaefer** (1967), *Professor of Health Administration and Clinical Professor, Department of Psychiatry* — B.S., 1943 (New Jersey State); M.A., 1951 (New School for Social Research); D.P.A., 1962 (Syracuse)
- Preston L. Schiller** (1979), *Assistant Professor of Health Education* — B.A., 1970 (Oakland University); M.A., 1972, Ph.D., 1977 (Washington University)
- Victor J. Schoenbach** (1980), *Research Assistant Professor of Epidemiology* — B.S., 1968 (Columbia University); M.Sc., 1969 (University of London); M.S.P.H., 1975, Ph.D., 1979 (The University of North Carolina at Chapel Hill)
- Ernest Schoenfeld** (1972), *Assistant Dean and Clinical Assistant Professor of Parasitology and Laboratory Practice* — A.A.S., 1956 (State University Agricultural and Technical Institute); B.S., 1964 (Cornell); M.P.H., 1977, Dr.P.H., 1981 (The University of North Carolina at Chapel Hill)
- Lisbeth B. Schorr** (1981), *Visiting Professor in Maternal and Child Health* — B.A., 1952 (University of California, Berkeley)
- Stephen R. Schroeder** (1972), *Associate Professor of Psychiatry and Research Associate Professor of Psychology, Adjunct Associate Professor of Nutrition* — B.S., 1958 (Josephinum); M.A., 1964 (Toledo, Ohio); Ph.D., 1967 (Pittsburgh)

- John Richard Seed** (1981), *Professor and Chairman, Parasitology and Laboratory Practice, School of Public Health* — A.B., 1959 (Lafayette College); Ph.D., 1963 (Yale University)
- Pranab Kumar Sen** (1965), *Professor of Biostatistics* — B.S., 1955, M.S., 1957, Ph.D., 1962 (Calcutta University, India)
- Richard H. Shachtman** (1968), *Professor of Biostatistics, Operations Research and Systems Analysis; Director, The LOH Project* — B.A., 1963 (North Carolina State); M.A., 1967, Ph.D., 1968 (Maryland) On Leave January 1, 1981 - June 30, 1982.
- Babubhai V. Shah** (1971), *Adjunct Professor of Biostatistics* — B.Sc., 1955, M.Sc., 1957, Ph.D., 1960 (Bombay)
- Iris Reed Shannon** (1977), *Adjunct Associate Professor of Public Health Nursing* — B.S.N., 1948 (Fisk Meharry Medical College); M.A., 1954 (Chicago)
- Charles C. Shepard** (1963), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1936 (Stanford); M.S., 1938, M.B., 1940, M.D., 1941 (Northwestern)
- Cecil George Sheps** (1968), *Taylor Grandy Distinguished Professor of Social Medicine, Department of Social and Administrative Medicine and Professor of Epidemiology* — M.D., 1936 (Manitoba); M.P.H., 1947 (Yale); D.Sc., (Hon.), 1970 (Chicago Medical School)
- Jabbar Khan Sherwani** (1962), *Associate Professor of Environmental Engineering in the Department of Environmental Sciences and Engineering* — B.S., C.E., 1945 (Punjab); M.C.E., 1947 (Polytechnic Institute of Brooklyn); Ph.D., 1951 (Utah); M.P.A., 1958 (Harvard) Deceased, August 22, 1981.
- Morris A. Shiffman** (1964), *Professor of Environmental Health in the Department of Environmental Sciences and Engineering* — D.V.M., 1944 (Middlesex); M.P.H., 1945 (Michigan); Docteur-Veterinaire, 1949 (National Veterinary College, France); M.G.A., 1957, Ph.D., 1967 (Pennsylvania)
- Steven L. Shore** (1979), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — A.B., 1963, A.M., 1963 (University of Pennsylvania; M.D., 1967 (Johns Hopkins)
- Mark S. Shuman** (1970), *Professor of Environmental Chemistry in the Department of Environmental Sciences and Engineering* — B.S., 1959 (Washington State); Ph.D., 1966 (Wisconsin)
- Carl M. Shy** (1974), *Professor of Epidemiology and Professor of Environmental Sciences and Engineering* — A.B., 1956 (St. Louis); M.D., 1962 (Marquette); M.P.H., 1965, Dr.P.H., 1967 (Michigan)
- Earl Siegel** (1964), *Professor of Maternal and Child Health, School of Public Health and Clinical Professor of Pediatrics, School of Medicine* — B.S., 1944 (University of Pittsburgh); M.D., 1948 (New York Medical College); M.P.H., 1961 (University of California)
- Philip C. Singer** (1973), *Professor of Environmental Sciences and Engineering* — B.C.E., 1963 (The Cooper Union); M.S., 1965 (Northwestern); S.M., 1965, Ph.D., 1969 (Harvard)
- David S. Siscovick** (1981), *Clinical Assistant Professor of Epidemiology* — B.A., 1971 (University of Pennsylvania); M.D., 1976 (University of Maryland)
- Herschel H. Slater** (1980), *Adjunct Associate Professor of Environmental Sciences and Engineering* — B.A., 1941 (University of Northern Iowa); M.S., 1951 (New York University)
- Cecil Slome** (1962), *Professor of Epidemiology* — M.B.Ch.B., 1944 (Cape Town, S. Africa); D.P.H., 1954 (London) Deceased, July 23, 1981.
- William Thomas Small, Jr.** (1971), *Assistant Dean Student Affairs* — B.S., 1965 (North Carolina Central University); M.S.P.H., 1969 (The University of North Carolina at Chapel Hill)
- Allan H. Smith** (1977), *Adjunct Associate Professor of Epidemiology* — B.Sc., 1964 (Victoria University of Wellington, New Zealand); B.Med.Sci., 1969, MB, ChB, 1970, Ph.D., 1975 (University of Otago, New Zealand)
- Peter Byrd Smith** (1978), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1949 (Richmond); M.S., 1951 (Tennessee); Ph.D., 1959 (Wisconsin)
- Mark D. Sobsey** (1974), *Associate Professor of Environmental Sciences and Engineering, School of Public Health, and Bacteriology and Immunology, School of Medicine* — B.S., 1965, M.S., 1967 (Pittsburgh); Ph.D., 1971 (California, Berkeley)

- Francis W. Spierto** (1980), *Adjunct Associate Professor, Parasitology and Laboratory Practice (Field)* — B.A., 1964 (St. Vincent College); Ph.D., 1969 (Purdue University)
- Paul S. Stansbury** (1977), *Assistant Professor of Radiological Hygiene in the Department of Environmental Sciences and Engineering* — B.S., 1970, M.S., 1971, Ph.D., 1977 (Georgia Institute of Technology)
- Allan Steckler** (1975), *Associate Professor of Health Education* — B.S., 1964, M.P.H., 1965, Dr.P.H., 1971 (UCLA)
- Arthur C. Stern** (1968), *Professor of Air Hygiene in the Department of Environmental Sciences and Engineering, Emeritus (1978)* — M.E., 1930, M.S., 1933 (Stevens Institute of Technology); Dr. of Engineering, Honoris Causa, 1975 (Stevens Institute of Technology)
- Guy W. Steuart** (1969), *Professor and Chairman of Health Education, M.A.*, 1944, M.Ed., 1950 (South Africa); M.P.H., 1953 (Yale); Ph.D., 1960 (Natal)
- John A. Stewart** (1975), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — A.B., 1956 (Houghton); M.D., 1961, M.S., 1968 (Rochester)
- George M. Stockbridge** (1978), *Lecturer in Health Administration*
- E. Barbara Stocking** (1963), *Associate Professor of Maternal and Child Health and Public Health Nursing, Emerita (1981)* — Dip. in Nursing, 1937 (Capital City School School of Nursing); B.S., 1952 (Wayne State University); M.P.H., 1957 (Harvard University)
- Connie J. Stone** (1977), *Adjunct Assistant Professor of Parasitology and Laboratory Practice* — B.A., 1968, M.S., 1970 (Indiana); Ph.D., 1976 (Indiana University Medical Center)
- Frank Thomas Stritter** (1971), *Associate Professor, Schools of Medicine, Education, and Public Health* — A.B., 1959 (St. Lawrence); M.A., 1961 (Colgate); Ph.D., 1968 (Syracuse)
- Chirayath M. Suchindran** (1972), *Associate Professor of Biostatistics* — B.Sc., 1960, M.Sc., 1962 (Kerala); M.S.P.H., 1968, Ph.D., 1972 (The University of North Carolina at Chapel Hill)
- W. Daniel Sudia** (1966), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1949 (Florida); M.S., 1950, Ph.D., 1958 (Ohio State)
- Jeremiah Michael Sullivan** (1978), *Research Associate Professor of Biostatistics* — B.S., 1961, M.A., 1967, Ph.D., 1970 (Princeton)
- Alexander J. Sulzer** (1978), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.A., 1965 (Hardin-Simon); M.Sc., 1960, Ph.D., 1962 (Emory)
- James Suver** (1981), *Visiting Professor of Health Administration* — B.S.B.A., 1962, (Sacramento State College); M.B.A., 1965, D.B.A., 1971 (Harvard)
- Ingrid Elizabeth Swenson** (1978), *Assistant Professor of Nursing and of Maternal and Child Health, School of Public Health* — B.S.N., 1971 (Maryland); M.P.H., 1973, D.P.H., 1976 (Johns Hopkins)
- Michael R. Swift** (1972), *Professor of Medicine and Clinical Professor of Epidemiology* — B.A., 1955 (Swarthmore); M.A., 1957 (California, Berkeley); D.M., 1962 (New York University)
- Boyd R. Switzer** (1972), *Associate Professor of Nutrition and Adjunct Associate Professor of Biochemistry & Nutrition* — B.A., 1965 (Bridgewater); Ph.D., 1971 (The University of North Carolina at Chapel Hill)
- Michael Joseph Symons** (1969), *Professor of Biostatistics* — B.A., 1965 (Bowling Green); M.P.H., 1967, Ph.D., 1969 (University of Michigan)
- Dorothy McComb Talbot** (1974), *Professor and Chairman of Public Health Nursing* — Dip. in Nursing, 1940 (Jefferson Hospital, Philadelphia); B.S.N., 1945 (Texas State College for Women); M.A., 1958 (Columbia); M.P.H., 1964, Ph.D., 1970 (Tulane)
- Rosalind Thomas** (1979), *Clinical Assistant Professor in Health Education* — B.A., 1974 (College of William & Mary); M.P.H., 1975 (The University of North Carolina at Chapel Hill)
- Clyde Thornsberry** (1972), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1957, Ph.D., 1966 (Kentucky)
- Nancy L. Tigar** (1978), *Lecturer in Public Health Nursing* — Dip. in Nursing, 1955 (Methodist Hospital, Philadelphia); B.S.N., 1962 (University of Pennsylvania); M.P.H., 1971 (University of Michigan)

- Hugh H. Tilson** (1979), *Adjunct Professor in Health Administration and Adjunct Professor of Social and Administrative Medicine* — M.D., 1964 (Washington University); M.P.H., 1969, Dr.P.H., 1972 (Harvard)
- Helen L. Tinnin** (1975), *Adjunct Associate Professor of Health Education* — B.A., 1952, M.P.H., 1961 (California at Berkeley); Ph.D., 1964 (Ohio State)
- Jerry J. Tulis** (1976), *Clinical Professor of Parasitology and Laboratory Practice* — B.S., 1953 (Illinois); M.S., 1955 (Loyola); Ph.D., 1965 (Catholic University of America)
- Craig David Turnbull** (1971), *Associate Professor of Biostatistics* — B.A., 1962 (Albright); M.P.H., 1965, Ph.D., 1971 (The University of North Carolina at Chapel Hill)
- Alvis G. Turner, Jr.** (1969), *Associate Professor of Environmental Sciences in the Department of Environmental Sciences and Engineering* — B.A., 1952, M.S.P.H., 1958 (The University of North Carolina); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Eunice Nickerson Tyler** (1945), *Professor of Health Education, Emerita (1966)* — Ph.B., 1931 (Brown); C.P.H., 1933, M.P.H., 1936, Ph.D., 1946 (Yale)
- Herman Alfred Tyroler** (1960), *Alumni Distinguished Professor of Epidemiology* — A.B., 1943 (Ohio); M.D., 1947 (New York)
- J. Richard Udry** (1965), *Professor of Maternal and Child Health, Professor of Sociology, and Director of Carolina Population Center* — B.S., 1950 (Northwestern University); M.A., 1956 (Long Beach State College); Ph.D., 1960 (University of Southern California)
- H. Mac Vandiviere** (1968), *Adjunct Associate Professor of Parasitology & Laboratory Practice (Field)* — A.B., 1943, M.A., 1944 (Mercer); M.D., 1960 (The University of North Carolina at Chapel Hill)
- James E. Veney** (1970), *Professor of Health Administration* — B.A., 1961 (Ohio); M.S., 1963, Ph.D., 1966 (Purdue)
- I. Kay Wachsmuth** (1978), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1966 (Stetson); Ph.D., 1975 (Tennessee)
- Edward Harris Wagner** (1971), *Associate Professor of Medicine, Family Medicine, School of Medicine and Epidemiology, School of Public Health* — B.A., 1961 (Princeton); M.D., 1965 (State University of New York); M.P.H., 1972 (The University of North Carolina at Chapel Hill)
- Patricia F. Waller** (1970), *Research Professor of Health Administration* — A.B., 1953, M.S., 1955 (Miami); Ph.D., (North Carolina)
- Kenneth W. Walls** (1964), *Adjunct Associate Professor of Parasitology and Laboratory Practice (Field)* — A.B., 1949 (Indiana); M.S., 1952, Ph.D., 1955 (Michigan)
- Arthur W. Waltner** (1968), *Professor of Environmental Sciences and Engineering* — A.B., 1938 (Bethel); M.S., 1943 (Kansas State); Ph.D., 1949 (The University of North Carolina at Chapel Hill)
- David Grant Warren** (1964), *Adjunct Professor of Health Administration* — A.B., 1958 (Miami); J.D., 1964 (Duke)
- Elizabeth L. Watkins** (1977), *Professor of Maternal and Child Health* — A.B., 1944 (Bryn Mawr); M.S.S.A., 1950 (Case Western Reserve); M.Sc.H., 1958, D.Sc. in H., 1966 (Harvard)
- Julia Day Watkins** (1964), *Associate Professor of Public Health Nursing and Nursing, Emerita (1981)* — A.B., 1939 (Bryn Mawr); R.N., 1944 (Virginia); M.P.H., 1957 (North Carolina) Retired June 30, 1981.
- James E. Watson, Jr.** (1974), *Associate Professor of Radiological Hygiene in the Department of Environmental Sciences and Engineering* — B.S., 1960, M.S., 1962 (North Carolina State); Ph.D., 1970 (The University of North Carolina at Chapel Hill)
- Norman Fred Weatherly** (1963), *Professor of Parasitology and Laboratory Practice* — B.S., 1953, M.S., 1960 (Oregon State); Ph.D., 1962 (Kansas State)
- Stanley John Weidenkopf** (1965), *Professor of Environmental Engineering in the Department of Environmental Sciences and Engineering, Emeritus (1972)* — B.S.C.E., 1932 (Wisconsin); M.P.H., 1949 (Minnesota); Eng.D., 1957 (Johns Hopkins)
- Charles Manuel Weiss** (1956), *Professor of Environmental Biology in the Department of Environmental Sciences and Engineering* — B.S., 1939 (Rutgers); Ph.D., 1950 (Johns Hopkins)

- Henry Bradley Wells** (1958), *Professor of Biostatistics, Emeritus (1980)* — B.A., 1950 (Emory); M.S.P.H., 1953, Ph.D., 1959 (The University of North Carolina at Chapel Hill)
- Betty Jane Barbrey West** (1975), *Adjunct Assistant Professor of Public Health Nursing, Emerita (1979)* — Dip. in Nursing, 1945 (Duke); B.S.N., 1957 (The University of North Carolina); M.P.H., 1964 (The University of North Carolina at Chapel Hill)
- Tony L. Whitehead** (1976), *Assistant Professor of Health Education* — B.A., 1965 (Shaw); M.Sc., 1969, Ph.D., 1976 (Pittsburgh)
- Allen J. Wilcox** (1979), *Adjunct Assistant Professor of Epidemiology* — B.A., 1968, M.D., 1973 (University of Michigan); M.P.H., 1976, Ph.D., 1979 (The University of North Carolina at Chapel Hill)
- Barbara Wilcox** (1981), *Adjunct Associate Professor of Public Health Nursing* — B.S., 1944 (Columbia); M.P.H., 1954 (Harvard)
- Hazel W. Wilkinson** (1972), *Adjunct Assistant Professor of Parasitology and Laboratory Practice (Field)* — B.S., 1963, M.S., 1965, Ph.D., 1972 (Georgia)
- William E. Wilkinson** (1977), *Adjunct Associate Professor of Biostatistics* — B.S., 1959 (Davidson); Ph.D., 1968 (The University of North Carolina at Chapel Hill)
- Carolyn A. Williams** (1971), *Associate Professor of Epidemiology and Associate Professor of Nursing* — B.S., 1961 (Texas Woman's University); M.S., 1965, Ph.D., 1969 (The University of North Carolina at Chapel Hill)
- O. Dale Williams** (1970), *Professor of Biostatistics* — B.S., 1962 (Southeastern Louisiana); M.P.H., 1965, Ph.D., 1971 (The University of North Carolina at Chapel Hill)
- William E. Wilson, Jr.** (1973), *Adjunct Associate Professor of Air and Industrial Hygiene in the Department of Environmental Sciences and Engineering* — B.S., 1953 (Hendrix College); Ph.D., 1957 (Purdue)
- Kenneth R. Wing** (1977), *Assistant Professor of Law and Health Administration* — A.B., 1968 (California, Santa Cruz); J.D., 1971, M.P.H., 1972 (Harvard)
- Oleh Wolowyna** (1979), *Research Assistant Professor of Biostatistics* — Licenciado, 1971 (Universidad Nacional de Buenos Aires); M.A., 1974 (University of Florida); Ph.D. 1979 (Erown University)
- John Joseph Wright** (1939), *Professor of Health Administration, Emeritus (1970)* — A.B., 1931, M.D., 1935 (Vanderbilt); M.P.H., 1939 (Johns Hopkins)
- David Zalkind** (1979), *Adjunct Associate in Biostatistics* — B.A., 1967 (Harvard); M.S., 1968 (Stanford University); Ph.D., 1972 (Johns Hopkins University)
- William M. Zelman** (1978), *Assistant Professor of Health Administration* — B.A., 1964 (San Francisco State College); M.A., 1966, Ph.D., 1969 (Washington); M.Acc., 1977, C.P.A., 1978 (Denver)
- Donald W. Ziegler** (1973), *Adjunct Associate Professor of Parasitology and Laboratory Practice* — A.B., 1948, M.S., 1950 (Nebraska); Ph.D., 1959 (Pennsylvania)



## courses of instruction

Note: Courses numbered 100 through 199 are for advanced undergraduates and graduates and those numbered from 200 to 399 are for graduates only.

BIOS	Biostatistics
ENVR	Environmental Sciences and Engineering
EPID	Epidemiology
HEED	Health Education
HPAA	Health Policy and Administration
MHCH	Maternal and Child Health
NUTR	Nutrition
PALP	Parasitology and Laboratory Practice
PHNU	Public Health Nursing

### Department of Biostatistics

BIOS	98	<b>Readings in Biostatistics</b> (1-3). Directed readings or laboratory study. May be taken more than once. Two to six laboratory hours a week. Staff.
BIOS	99	<b>Honors in Biostatistics</b> (3). Prerequisite, BIOS 98. Directed research. Written and oral reports required. <i>Fall, spring and summer.</i> Staff.
BIOS	101	<b>Public Health Statistics</b> (3). Introduction to procedures in summarization, analysis, and presentation of data. Topics include data classification, graphics, measures of central tendency and variability, probability distributions, sampling, confidence interval, and tests of hypotheses. <i>Fall, spring.</i> Bangdiwala and Quade.
BIOS	105	<b>Principles of Statistical Inference</b> (3). An introduction to the methods of modern statistical analysis and their use in drawing conclusions from data collected in surveys and in the laboratory. Topics cover probability distributions, confidence interval estimation of population parameters, tests of significance, analysis of variance correlation and regression. <i>Fall, spring and summer.</i> Staff.
BIOS	106	<b>Mathematical Methods in Biostatistics</b> (MATH 106) (3). Prerequisite, MATH 32 or equivalent. Special mathematical techniques in the theory and the methods of

biostatistics as related to the life sciences and public health. Includes brief review of calculus, selected topics from intermediate calculus, and introductory matrix theory for applications in biostatistics. *Nine lecture hours a week, second summer session.* Grimson.

- BIOS 111** **Introduction to Statistical Computing and Data Management** (3). Introduction to use of computers to process and analyze data, components of digital computers, characteristics of magnetic storage devices, use of JCL and utility programs, concepts and techniques of research data management, use of statistical program packages and interpretation. *Fall, spring and summer.* Helms and Hosking.
- BIOS 120** **Special Techniques in Biometry** (1-3). Special topics of current interest in biometry. *Fall, spring and summer.* Staff.
- BIOS 135** **Probability and Statistics** (4). Prerequisite, integral calculus. Basics of probability; random variables and their probability distributions; special distributions, including the binomial, Poisson, normal, gamma; expectation and moments; linear combinations of random variables. Elements of estimation and hypothesis testing; analysis of variance; multiple regression, analysis of categorical data, some nonparametric methods. Particular attention is given to the statistical treatment of environmental science and engineering problems. *Fall.* Koch.
- BIOS 140, 141, 142** **Problems in Biostatistics** (1 or more). Prerequisites to be arranged with the faculty in each case. A course for students of public health who wish to make a study of some special problem in the statistics of the life sciences and public health. *Fall, spring and summer.* Staff.
- BIOS 145** **Principles of Experimental Analysis** (3). Prerequisite, BIOS 105 or equivalent. Continuation of BIOS 105; multiple regression, design and analysis of simple experiments, nonparametric and other procedures. *Fall and spring.* Staff.
- BIOS 146** **Sources of Health Related Data and Descriptive Methods** (1). A general survey of sources of health related data in the U.S. Particular attention is paid to the data gathered by the Bureau of the Census and the National Center for Health Statistics. Methods of descriptive data analysis are summarized. Quality of data, statistical and data management packages and administrative principles are introduced. *Fall.* Gillings.
- BIOS 150** **Elements of Probability and Statistical Inference** (STAT 101). (3). Prerequisite, integral calculus. Fundamentals of probability theory; descriptive statistics; fundamentals of statistical inference, including estimation and hypothesis testing *Fall.* Staff.
- BIOS 160** **Probability and Statistical Inference** (STAT 126-7) (6). Prerequisite, integral calculus. Introduction to the theory of probability; random variables, probability distributions, generating functions, sums and sequences of random variables. Distributions of functions of random samples; theory of estimation; hypothesis testing. *Fall.* Kupper.
- BIOS 162** **Introductory Applied Statistics** (3). Corequisite, BIOS 150 or equivalent. Approaches to problems of description, and goodness of fit, univariate location and scale, bivariate independence and correlation, and comparison of independent or matched samples, involving categorical, discrete, normal, or ranked data. *Spring.* Quade.
- BIOS 163** **Introduction to Linear Models** (3). Prerequisites, BIOS 150 and 162, or equivalents, and elementary knowledge of matrix arithmetic and computing. The general linear model in matrix terms, simple and multiple regression, analysis of variance and covariance, elements of experimental design and analysis, random effects models, discriminant analysis, simultaneous inference. *Spring.* Gillings.

- BIOS 164 **Sample Survey Methodology** (STAT 104) (3). Prerequisite, BIOS 150 or equivalent or permission of instructor. Fundamental principles and methods associated with survey sampling, giving primary attention to as non-mathematical as possible a treatment of simple random sampling, stratified sampling, and cluster sampling. Also, techniques of questionnaire design; the problems of nonresponse, and sources of non-sampling errors. Practical experience in the applied aspects of sampling is provided by student participation in the design, execution, and analysis of an actual survey. *Spring*. Kalsbeek.
- BIOS 165 **Analysis of Categorical Data** (EPID 165) (3). Prerequisites, BIOS 105 and EPID 160, or equivalents. Analysis of categorized data, with special emphasis on methods of use in epidemiology; contingency tables, rates and relative risk, survivorship and life table methods, linear models for categorical data. *Spring*. Symons.
- BIOS 166 **Applied Multivariate Analysis** (STAT 160) (3). Prerequisite, BIOS 145 or 163, or equivalent. Application of multivariate techniques, with emphasis on the use of computer programs. Multivariate analysis of variance, principal components, factor analysis, path analysis, discriminant analysis, canonical correlation, and cluster analysis. *Fall*. Staff.
- BIOS 167 **Applied Stochastic Processes** (ORSA 167) (3). Prerequisite, BIOS 160 or equivalent. Survey of renewal theory. Markov chains, Poisson processes and extensions, epidemic models, branching processes and other stochastic models of empirical processes. Disease, population, and health services applications. *Fall*. Shachtman.
- BIOS 170 **Demographic Techniques I** (3). Prerequisite: BIOS 101 or equivalent. Sources and interpretation of demographic data; rates and ratios, standardization, complete and abridged life tables; estimation and projections of fertility, mortality, migration, and population composition. *Fall*. Staff.
- BIOS 213 **Data Management in Biostatistics** (3). Prerequisite, BIOS 111 or equivalent. Techniques for designing, implementing, and operating computerized data management systems for large studies with particular emphasis on collaborative medical studies. *Fall*. Hosking.
- BIOS 215 **Health Data Processing Laboratory** (1-3). Prerequisite, BIOS 213. A laboratory course for students who wish to gain experience in the data processing aspects of current projects and collaborative medical studies of the Department. *Two or more hours a week, fall, spring, and summer*. Hosking.
- BIOS 224 **Some Quantitative Methods in Planning and Evaluation** (HPAA 224) (3). Prerequisite, BIOS 101 or equivalent or permission of instructor. Planning cycle, methods overview, data sources, PERT, budgeting, health indices, measurement of goal fulfillment, achievement, effectiveness, efficiency, research designs, benefit cost analysis, decision analysis, probability utility, and decision trees. *Two lecture and two laboratory hours a week, spring*. Gillings, Coulter.
- BIOS 230 **Research Issues in Mental Health Statistics** (3). Prerequisites, BIOS 105 and EPID 160, or permission of instructor. Concepts of measurement, history, and current status of classification schemata for mental disorders, methods of data analysis, and research designs. *Spring*. Turnbull.
- BIOS 240, 241, 242 **Specialized Methods in Health Statistics** (1 or more). Prerequisite, permission of the instructor. Statistical theory applied to a special program area of timely importance in the life sciences and public health. Lectures, seminars and/or laboratory work, according to the nature of the special area under study. *Fall, spring, and summer*. Staff.
- BIOS 250 **Advanced Techniques in Biometry** (1-3). Prerequisites, BIOS 160 and 163; or equivalents. Three separate modules presenting advanced techniques in bio-

metry (not the same selection at each offering). *Three-six lecture hours a week, first and second summer sessions.* Staff.

- BIOS 256 **Introduction to Nonparametric Statistics** (STAT 171) (3). Prerequisite, BIOS 160 or equivalent. Theory and application of nonparametric methods for various problems in statistical analysis. Includes procedures based on randomization, ranks and U-statistics. A knowledge of elementary computer programming is assumed. *First summer session.* Quade.
- BIOS 257 **Nonparametric Procedures in Biometric Research** (3). Prerequisite, BIOS 256 or equivalent. Nonparametric point and interval estimation in linear models useful in biometric research. Robust procedures, including those based on ranks, for analyzing designed experiments and bioassays. (1981 and alternate years). *Spring.* Sen.
- BIOS 260 **Large Sample Theory** (3). Prerequisite, BIOS 160, corequisite, MATH 121. An introduction to limit theorems and laws of large numbers in probability, statistics, and stochastic processes. *Fall.* Sen.
- BIOS 264 **Advanced Survey Sampling Methods** (3). Prerequisite, BIOS 164 or equivalent. Continuation of BIOS 164 for advanced students; stratification, special designs, multistage sampling, cost studies, nonsampling errors, complex survey designs, employing auxiliary information, and other miscellaneous topics. (1982 and alternate years). *Fall.* Kalsbeek.
- BIOS 265 **Linear Models in Categorical Data Analysis** (3). Prerequisite, BIOS 266. Theory of statistical methods for analyzing categorical data by means of linear models, multifactor and multiresponse situations; interpretation of interactions. *Spring.* Koch.
- BIOS 266 **Linear Models I** (4). Prerequisites, linear algebra, BIOS 116, 160, 162, 163, or equivalents. Multivariate normal and related distributions; basic univariate and multivariate linear models; computational aspects. *Fall.* Helms.
- BIOS 267 **Linear Models II** (4). Prerequisite, BIOS 266. Principal components, discriminate functions, canonical variates, repeated measurements experiments, analysis of longitudinal data, components of variance. *Spring.* Helms.
- BIOS 271 **Demographic Techniques II** (3). Prerequisites, BIOS 170 and integral calculus. Methods of analysis when data are deficient; population projection methods; stable and quasistable methods; interrelations among demographic variables; migration analysis; uses of population models. *Spring.* Suchindran.
- BIOS 277 **Mathematical Models in Demography** (3). Prerequisite, permission of the instructor. A detailed presentation of natality models, including necessary mathematical methods, and applications; deterministic and stochastic models for population growth, migration, etc. (1981 and alternate years.) *Spring.* Suchindran.
- BIOS 280 **Survivorship Analysis** (3). Prerequisite, permission of instructor. Survival functions, hazard rates, life tables, estimation of survival functions from complete and censored data, fitting parametric models, comparisons of mortality experiences, competing risks, concomitant variables, applications to clinical trials (1982 and alternate years.) *Spring.* Elandt-Johnson.
- BIOS 281 **Statistical Methods in Human Genetics** (GENT 281) (3). Prerequisite, permission of instructor. An introduction to statistical procedures for genetic counseling testing genetic hypothesis, and estimating genetic parameters from human data. Topics covered include models for monogenic autosomal and x-linkage, mutation and selection, polygenic inheritance. Special emphasis is given to segregation and linkage analysis. (1981 and alternate years.) *Spring.* Staff.

- IOS 301 Field Observation in National Health Statistics (1).** Orientation to the organization and operation of the major national agencies concerned with demographic and health statistics. Supervised visits to the U.S. Bureau of the Census, National Center for Health Statistics, and the National Institutes of Health. Lectures and demonstrations by administrative and research personnel. Field fee \$150. *Fall*. Staff and agency counselors.
- IOS 302 Field Training in Public Health Statistics (1-6).** This course is designed to offer students majoring in biostatistics an opportunity for supervised experience in all phases of the statistical programs in the selected health agencies. Open only to students majoring in biostatistics. Field fee \$450. *Summer*. Staff and field counselors.
- IOS 340 Statistical Consulting in the Health Sciences (2 or more).** Prerequisite, a minimum of one year of graduate work in statistics. By actual participation in current projects, the advanced student is given instruction in the processes of statistical consulting service for health sciences; initial and continuing conference with the research worker in a health science, definition of the problem in statistical terms, design of experiment with reference to statistical implications, analysis of data, and report writing. *Four or more laboratory hours a week, fall, spring, and summer*. Staff.
- IOS 341, 342**
- IOS 350, 351, 352 Training in Statistical Teaching in the Health Sciences (2 or more).** Prerequisite, a master's degree or equivalent. Principles of statistical pedagogy. Students are responsible for assistance in teaching elementary statistics to students in the health sciences. Students work under the supervision of the faculty with whom they have regular discussions of methods, content, and evaluation of performance. *Four or more laboratory hours a week, fall, spring and summer*. Staff.
- IOS 389 Research Seminar in Biostatistics (1-3).** Prerequisite, permission of the instructor. Seminar on new research developments in selected biostatistical topics. *Fall and spring*. Staff.
- IOS 390, 391, 392 Research in Biostatistics (2 or more).** Individual arrangements may be made by the advanced student to spend part or all of his time in supervised investigation of selected problems in statistics. *Four or more laboratory hours week, fall, spring and summer*. Staff.
- OS 393 Masters Thesis (0-6).** *Fall, spring, and summer*. Staff.
- OS 394 Doctoral Dissertation (0-9).** *Fall, spring, and summer*. Staff.
- OS 400 General Registration (0)**

## Department of Environmental Sciences and Engineering

- IVR 51 American Environmental Policy (3).** Using history to illuminate present and emerging issues, the development of American environmental policies will be surveyed. Policies affecting environmental hazards, resource opportunities and other environmental issues will be included. *Fall*. Andrews.
- IVR 99 Undergraduate Research (3).** Directed readings or laboratory study. Written report is required. May be taken more than once for credit. *6-9 hours per week, fall, spring, summer*. Staff.
- IVR 100 Reading in Environmental Sciences and Engineering (1-6).** Prerequisite, permission required for students outside the Department. Extensive library study of a specific subject in environmental sciences and engineering. The subject and requirements of the project are arranged with the faculty in each instance. *Fall, spring, summer*. Staff.

- ENVR 101 Survey of Environmental Problems (3).** A survey of basic environmental issues for the non-technologist, including physical dynamics of the natural environment, specific environmental problems, and quality control techniques. *Spring*. Christman, Turner, Piver.
- ENVR 110 Principles of Chemical Carcinogenesis (2).** Prerequisite, organic chemistry and permission of the instructor. Review of DNA structure, replication, repair and the control of these processes. Bioactivation of carcinogens and the interaction of activated metabolites with DNA will also be covered. *First summer session*. Gold.
- ENVR 111 Environmental Policy Analysis I (3).** Current issues in environmental protection. Analysis of environmental problems and decisions from the viewpoints of the various disciplines concerned with the assessment of risk, policy development and environmental management. *Fall*. Shiffman.
- ENVR 118 Quantitative Studies for Environmental Sciences (5).** Prerequisite, MATH 15 or equivalent. Applied mathematics from the viewpoint of the needs of those studying environmental science. Specific aspects of differential and integral calculus are developed as needed in environmental hygiene. *Ten lecture and eight laboratory hours a week, second summer session*. Reist.
- ENVR 122 Water Chemistry (4).** Prerequisites, CHEM 11 and CHEM 21 or equivalents. Principles and applications of water chemistry. Consideration of equilibrium relationships in aqueous solutions such as natural waters. Proton transfer, solubility, complex formation, and redox reactions in natural waters are discussed. Examples in natural systems include alkalinity, hardness, chemistry of iron, manganese, aluminum, and the oxidation of organic carbon. Thermodynamic background for equilibrium calculations, including free energy and activity relationships, is presented. Laboratory includes examples of titrimetric, colorimetric, and electrometric methods of water analysis. *Three lecture and two laboratory hours a week, fall*. Johnson, Singer.
- ENVR 123 Organic Materials in Natural Waters (3).** Prerequisites, organic chemistry, instrumental analysis, or permission of the instructor. Origins of natural product or organic materials in rivers and lakes. Survey of synthetic organic waste sources, microbial transformations, and metal transport properties. Organic water quality monitoring and rationale for water quality criteria and standards. *Spring, alternate years*. Christman.
- ENVR 124 Environmental Kinetics of Chemistry and Biology (2).** Prerequisite, ENVR 122. Rates of chemical and biological processes of environmental systems. Theory and models of gas and solution kinetics. Applications are primarily to the chemical kinetics of complex reactions in aqueous solution. *Fall*. Johnson.
- ENVR 127 Oceanography (3).** (ZOOL 126, MASC 101). Prerequisite, ZOOL 11 or BOTN 11. *Fall*. Neumann, Kuenzler.
- ENVR 128 Chemical Oceanography (MASC 105) (3).** Prerequisites, one semester of physical chemistry or ENVR 122, CHEM 180 or equivalent. Presentation and interpretation of the complex chemistry of the oceans, the variation and abundance of the sea water constituents, and the chemical, physical and biological processes contributing to the distribution of the chemical species. The special problem relating to the introduction and dispersion of conservative and nonconservative substances will also be considered. *Spring*. Martens, Johnson.
- ENVR 128L Chemical Oceanography Lab (MASC 105L) (1).** *Two laboratory hours a week, spring*. Martens, Johnson.
- ENVR 131 Biology in Environmental Science (3).** Prerequisite, general chemistry. An introduction to biology, including principles of biochemistry, cell structure, classification, and ecology. Laboratory emphasizes techniques utilized in measurement.

and control of environmental pollution. *Two lecture and two laboratory hours a week, spring.* Francisco.

- NVR 132 **Limnology and Water Pollution** (3). Prerequisites, two semesters of chemistry or ENVR 122. The basic determinants of water quality and limnological principles are used to define the ecology of clean and polluted aquatic environments, including lakes, reservoirs and rivers. *Two lecture and two laboratory hours a week, fall and spring.* Weiss.
- NVR 133 **Environmental Health and the Aquatic Environment** (3). Prerequisite, ENVR 135 or equivalent. An overview of environmental biology with emphasis on ecological theory as it relates to applied biological problems. Topics for discussion include the metabolism of individuals, the reaction of populations and communities to environmental stress and ecosystem responses to perturbations. The laboratory emphasizes techniques widely used in aquatic biology and pollution control. *Two lecture and three laboratory hours a week, fall.* Pfaender.
- NVR 134 **Environmental Microbiology** (3). Prerequisites, organic chemistry, ENVR 131 or ENVR 133, general biology, or permission of instructor. Principles of general microbiology; an examination of the microbial world with emphasis on nonpathogenic bacteria; their cytology, growth, physiology, and significance in the environment with special attention given to treatment processes. *Two lecture and three laboratory hours a week, spring.* Pfaender.
- NVR 135 **Ecology** (3). (BIOL 102, ZOOL 102, BOTN 141). Prerequisites, BOTN 11 or ZOOL 11 or BIOL 21, 22. *Fall and spring.* Reice, Stiven, Peet, White.
- NVR 135L **Ecology Laboratory** (1) (BIOL 120L, BOTN 141L, ZOOL 102L). Corequisite, ENVR 135. *Three laboratory hours a week, fall and spring.* Reice, Stiven, Peet, White.
- NVR 136 **Biological Oceanography** (4) (ZOOL 140, MASC 104) Prerequisites, ZOOL 105 and 102 or permission of instructor. *Spring.* Lopez.
- NVR 137 **Ecology of Wetlands** (4) (MASC 137). Prerequisites, one year biology, one semester ecology, one year chemistry and permission of the instructor. An introduction to the functioning of freshwater and estuarine marsh and swamp ecosystems, with emphasis on the systems of the southeastern U.S. *Fall.* Kuenzler, Frankenberg.
- NVR 138 **Environmental Virology** (4). Prerequisite, introductory course in microbiology; or ENVR 131 or 133; or permission. Ecological, environmental health and fundamental aspects of virology, with special emphasis on viruses in air, water, and food. *Three lecture and three laboratory hours a week, spring.* (Not offered spring, 1981) Sobsey.
- NVR 142 **Survey of Air and Industrial Hygiene** (3). A survey of current problems in air pollution, air pollution control and industrial hygiene including potential for exposure to disease-causing agents, standards and standards setting and methods of control. *First summer session.* Staff.
- NVR 143 **Applied Physiology and Toxicology** (3). Prerequisite, admission to graduate standing or permission of instructor. Physiologic responses of the various organs and organ systems of the body to the physical and chemical stresses of the environment are considered. The methods of industrial toxicology and the toxicological basis for the Threshold Limit Values will be discussed. Concentration-Time equivalence, routes of entry, synergism will be investigated. *Fall.* Gold.
- NVR 144 **Air Pollution, Measuring, Monitoring and Survey** (3). Prerequisites, graduate standing and permission of the instructor. Theory and application of the analysis of samples; manual methods; sensor calibration; site selection, monitoring; gas and aerosol samples. *Two lecture and four laboratory hours a week, spring.* Fox, Jeffries.

- ENVR 145 **Instrumentation and Data Acquisition** (3). Prerequisite, graduate standing or permission of the instructor. Concepts and principles employed in electronic-aided measurements of air quality and including acquisition of measurements, principles of input transduction, and online minicomputers. *Fall*. Jeffries.
- ENVR 146 **Industrial Hygiene Engineering Control Design** (3). Prerequisite, engineering degree or permission of the instructor. Design of industrial, exhaust systems and control of heat exposures in occupied spaces. *Fall*. Harris.
- ENVR 146L **Industrial Ventilation Laboratory** (1). Corequisite, ENVR 146. Laboratory exercises in fluid mechanics specifically related to industrial ventilation. *Fall*. Harris, Hickey.
- ENVR 147 **Occupational Safety** (2). Fundamentals of occupational safety with emphasis on legislation and organization of industrial safety programs including hazard recognition, analysis, control and motivational factors pertaining to industrial accident prevention. *Spring*. Ayoub.
- ENVR 161 **Elements of Radiological Hygiene** (2). Prerequisite, calculus. The physics of ionizing radiations, their interactions with matter, biological effects and principles of radiation protection are presented. *Spring and second summer session*. Watson, Willhoit, Stansbury.
- ENVR 162 **Modern Physics for Environmental Science** (3). Prerequisite, ENVR 118. Modern physics with the emphasis on radioactivity and ionizing radiation. *Fall*. Watson
- ENVR 163 **Radiation Instrumentation** (3). Corequisite, ENVR 162. A laboratory study of measurements of radioactivity with emphasis on the principles of operation of the instruments. *One lecture and four laboratory hours a week, fall*. Stansbury
- ENVR 164 **Field Observations in Radiological Hygiene** (2). Field observations of health physics practice at nuclear fuel cycle facilities and government nuclear facilities. Field fee, \$175.00. *Spring*. Watson.
- ENVR 165 **Advanced Radiological Laboratory** (2). Intensive radiological laboratory training at Oak Ridge associated universities. Tour of research facilities at Oak Ridge National Laboratory. Field fee, \$200.00. *Spring*. Stansbury.
- ENVR 167 **Introduction to Medical Physics** (2). Permission of the instructor required. The physics of radiation therapy, diagnostic radiology, and nuclear medicine are introduced by practicing clinical physicists. *Fall*. Stansbury, Chaney, Johnston Washburn.
- ENVR 171 **Water Quality Evaluation and Control** (3). Characteristics of water as a resource. Water use trends. Water quality concepts, measurements, criteria, problems, pollutants. Water supply and quality standards. *Fall*. Lamb.
- ENVR 174 **Water and Wastes Treatment Processes** (3). Prerequisites, ENVR 122, corequisite, ENVR 131 or permission of instructor. A one semester study of unit processes for water and waste water treatment. Processes discussed include gas transfer, coagulation, disinfection, absorption, demineralization, sedimentation, filtration, aerobic and anaerobic biological treatment. *Spring*. Singer, Lamb.
- ENVR 174L **Water and Wastes Treatment Processes Laboratory** (1). Corequisite, ENVR 174. Laboratory exercises to illustrate the process principles discussed in ENVR 174. *Two laboratory hours a week, spring*. Singer, Lamb.
- ENVR 176 **Engineering Hydraulics and Hydrology** (3). Prerequisites, MATH 31, 32; BIOE 105. Applied hydraulic computations including: hydrostatics, pipeline flows, networks, open channels, metering and pumping systems. Analytical techniques of surface and ground water hydrology. *Spring*. Lamb.

- NVR 183 Special Topics in Water Resources (2).** Prerequisite, permission of instructor. Interdisciplinary exploration of the principal issues involved in water resource planning, conservation, development and management. Includes the nature of water resource, principal water uses and conflicts, public objectives and policy issues, institutional arrangements, legal framework, planning and governmental agency programs. *Spring.* Okun.
- NVR 200 Problems in Environmental Sciences and Engineering (1 or more).** Departmental permission required. For students outside the Department who desire to undertake individual study of a specific problem in environmental sciences and engineering. The subject and requirements of the project are arranged with the faculty in each individual instance. *Two or more hours a week, fall, spring, summer.* Staff.
- NVR 211 Environmental Management (3).** Permission of the instructor required. An analysis of decision-making for environmental protection programs including policy development, program implementation and management approaches. Case studies of specific environmental protection problems emphasizing public policy and actions, organizational structure and institutional arrangements. *Fall.* Shiffman.
- NVR 212 Planning and Development of Environmental Hygiene Programs (3).** Prerequisite, permission of the instructor. Concepts and techniques in planning, organization and management. Covers program development, decision making, methods for achieving administrative ends, field supervision, criteria establishment and evaluation procedures with reference to environmental hygiene programs. *Two lecture and two seminar hours a week, spring.* Shiffman.
- NVR 215 Environmental Issues and Assessment (2).** Prerequisites ENVR 111, permission of the instructor. Concepts and methodologies for assessing the environmental, ecological and social consequences of technological development. The preparation of environmental impact statements will be considered as well as case studies of specific projects. *Three seminar hours a week, fall.* Shiffman, Weiss.
- NVR 217 Systems Analysis in Environmental Planning (PLAN 217) (3).** Prerequisite, calculus. Systems approach and scientific method. Various approaches to system design. Mathematical models. Production, benefit, loss and cost functions. Constrained optimization. Marginal analysis. Linear programming. Application of techniques to systems for the management of environmental quality. *Fall.* Staff.
- NVR 218 Environmental Systems Analysis I: Deterministic Models (3).** (PLAN 218). Prerequisite, calculus. Concepts of systems analysis. Modeling of environmental and urban systems. Elements of linear algebra. Classical optimization techniques. Marginal analysis models in economics. Mathematical programming models. Selected topics in linear, nonlinear, and dynamic programming. *Spring.* Staff.
- NVR 221 Instrumental Methods of Analysis (4).** Prerequisites, inorganic and analytical chemistry and permission of the instructor. Principles and techniques of instrumental chemical analysis, including optical, electrical and separation methods. Laboratory sessions include adsorption, spectrophotometry, potentiometry, amperometry, GC-mass spectrometry. *Two lecture and four laboratory hours a week, fall.* Shuman.
- NVR 222 Special Topics in Aquatic Chemistry (2).** Prerequisite, ENVR 122. Modern topics in aquatic chemistry, application of chemical concepts to the understanding and control of man's aquatic environment. This course may be taken for credit more than once, as the special topics change. *Fall, spring.* Johnson.
- NVR 223 Trace Elements in the Environment (3).** Prerequisite, ENVR 122 or equivalent. Transport and transformation of selected trace elements in the environmental

global cycles, societal flow, models and experimental approaches to chemical speciation. Health effects, societal targets, drinking water standards. *Fall*. Shuman.

- ENVR 224 **Chemical Modeling of Aquatic Systems** (3). Prerequisite, ENVR 122. The application of aquatic chemistry to modeling water supplies, wastewaters, rivers, lakes, estuaries, and the ocean. Stoichiometric, thermodynamic, and kinetic models are developed for these aquatic systems. *Spring*. Staff.
- ENVR 231A **Limnological Methods** (2). Prerequisites, basic limnology and statistics; must register for 231B in the second session. Professional preparation for field study of freshwater aquatic systems. *Two lecture and ten laboratory hours a week, first summer session*. Francisco.
- ENVR 231B **Limnological Methods** (2). Prerequisite, ENVR 231A. *Second summer session*, Francisco.
- ENVR 232 **Special Topics in Aquatic Biology** (2). Prerequisite, ENVR 132 or permission of instructor. Topics of contemporary concern to the management of the aquatic environment, e.g., movement of pesticides through aquatic food chains, growth of algae and nutrient levels, etc., will be discussed in depth. Course may be taken more than once as new topics are offered. *Spring*. Weiss, Kuenzler.
- ENVR 233 **Microbial Ecology** (4). Prerequisite, ENVR 134 or permission of instructor. A consideration of the factors which influence the distribution and inter-relationships of microorganisms in their natural habitats. *Two lecture and four laboratory hours a week, fall*. Pfaender.
- ENVR 234 **Bioassay for Environmental Effects** (2). Permission of instructor required. Bioassay techniques for environmental effects are evaluated with reference to health hazardous substances. Extrapolations for regulatory mandates as well as total ecosystem effects are examined. *Fall*. Weiss.
- ENVR 235 **Ecology of Phytoplankton (BOTN 245)** (4). Prerequisite, general biology or general ecology. The relationships of planktonic algae to their physical, chemical, and biotic environment, with emphasis on nutrition and primary productivity. *Three lecture and two laboratory hours a week, spring*. Kuenzler.
- ENVR 236 **Limnological Studies**. (2). Prerequisites, ENVR 132 or equivalent, permission of instructor. Limnological studies carried out by members of the faculty will be examined in terms of design, implementation, results, and conclusions as well as lessons for future projects. *Spring*. Weiss, Staff.
- ENVR 241 **Introduction to Aerosol Science** (3). Prerequisite, admission to the Department of Environmental Sciences and Engineering or permission of the instructor. Physical and chemical principles underlying behavior of particles suspended in air. Topics include rectilinear and curvilinear motion of the particles in a force field, diffusion, evaporation and condensation, electrical and optical properties and particle coagulation, as well as the behavior of the cloud *in toto*. *Fall*. Reist.
- ENVR 241L **Aerosol Science Laboratory** (1). Corequisite, ENVR 241. Basic laboratory exercises in aerosol sciences. *Fall*. Reist.
- ENVR 242 **Industrial Hygiene Practice** (3). Prerequisites, ENVR 143 and ENVR 241. Methodology and philosophy of evaluating the industrial environment for stresses and toxic substances which affect the health of the worker. The following topics are included: gases, vapors, fumes and dusts; radioactivity hazards, occupational diseases, thermal stress; illumination and exhaust ventilation. The laboratory periods are designed to provide practical experience in the use of the specialized instruments and techniques of this field. *Spring*. Fraser.

- NVR 243 Air and Its Contaminants (3).** Corequisite, ENVR 241. Behavior of atmosphere contaminants and the principles of making measurements in the air environment are studied. Fundamental concepts of meteorology are discussed. *Fall.* Fox.
- NVR 244 Industrial Hygiene Laboratory (3).** Prerequisite, ENVR 241; corequisite, ENVR 242. Demonstrates the principles of applying physical and chemical techniques to measure environmental exposures. Practical experiments and field studies will illustrate techniques applicable to the industrial hygiene survey. *One lecture and four laboratory hours a week, spring.* Reist.
- NVR 245 Air Pollution Control (3).** Prerequisite, ENVR 243. Sources of air pollution and their control are studied. Regulatory aspects and air pollution standards are discussed. *Spring.* Harris.
- NVR 246 Biological Effects of Air Pollution (3).** Prerequisites, ENVR 143, ENVR 243 or graduate standing in the biological sciences. Effects of community air pollutants on man, other animals, plants and microorganisms are studied. The "whole organism" response, the data relating to the biochemical response and the physiological mechanisms of responses are discussed. *Spring.* Staff.
- NVR 247 Chemistry of the Troposphere (3).** Prerequisites, physical chemistry and permission of instructor. Sources, variability, transformation and sinks of atmospheric trace constituents in the troposphere are covered. Photochemical and other chemical aspects of the atmosphere are covered. Topics include photochemical modeling, plume chemistry, and air pollution chemistry. *Spring.* Fox.
- NVR 248 Industrial Medicine—Practice and Management (3).** Prerequisite, ENVR 143 or equivalent. The technical factors to be considered in decision making and the roles and responsibilities of the industrial physician, nurse and industrial hygienist in the management of the work force. The etiology, diagnosis, treatment and prevention of diseases and stresses found in modern industry are discussed with applications for the use of general practitioners, health administrators, public health nurses and industrial professionals. *Spring.* Fraser.
- NVR 249 Air Pollution Meteorology (3).** Prerequisite, GEOG 110 or equivalent. Theory of transport and diffusion of air pollutants and application to practical problems and computations involving both single sources and multiple sources, including urban communities, modeling of transport and diffusion, both in wind tunnels and computers; stack design from the meteorological point of view; the organization of meteorological network and field studies; the measurement, monitoring and equipment requirements of pertinent meteorological parameters, air pollution climatology; meteorological management of air pollution. *Spring.* Slater.
- NVR 252 Environmental Protection II (3).** Environmental assessment and management of pesticide chemicals, hazardous wastes and community noise. Methodologies and rationale of human exposure and risk evaluation are presented. *Two lecture and two seminar hours per week. Fall.* Turner.
- NVR 253 Environmental Policy Analysis II (3).** Structure and dynamics of U.S. environmental policy making as it affects environmental management. Legislation, regulation and administration and the roles of science and analysis in political decisions are presented. *Two lecture and two seminar hours per week, spring.* Andrews.
- NVR 255 Management of Hazardous Waste (3).** Prerequisite, CHEM 61 or equivalent. The classification, chemistry and toxicology of hazardous wastes will be presented. Control technologies, regulatory policies and management strategies are examined. *Fall.* Turner.

- ENVR 261 **Radiation Biophysics (3)**. Prerequisite, ENVR 162 or equivalent. The biophysical factors of radiation quality and the response of cell populations are discussed. Current models of the mechanisms of radiation action on biological systems are reviewed. Microdosimetry and dosimetry at interfaces are also covered. *Spring*. Stansbury.
- ENVR 262 **Health Physics (3)**. Prerequisites, ENVR 163, ENVR 261, and ENVR 263. The principles of radiation protection are discussed and illustrated by laboratory and field exercises involving shielding, contamination control, waste disposal, radiation and contamination survey techniques, and legal and administrative procedures. The various isotope, x-ray, and other radiation facilities of the University are utilized in collaboration with the University Radiation Safety Office. *Two lectures and three laboratory hours a week, fall*. Staff.
- ENVR 263 **Radiation Hazards Evaluation I (3)**. Prerequisite, ENVR 162. The principles and techniques of external and internal radiation hazards evaluation are studied. The interaction of radiation with matter and the fundamentals of radiation dosimetry are presented. *Spring*. Watson.
- ENVR 264 **Radiation Hazards Evaluation II (3)**. Prerequisites, ENVR 261 and ENVR 263. Internal and external hazards of ionizing radiation are evaluated in detail. Problems in hazard evaluation and radiation of types included in certification examinations by the American Board of Health Physics are studied. *Fall*. Watson.
- ENVR 271 **Engineering Modeling of Aquatic Systems (3)**. Prerequisite, permission of the instructor. Examination of selected physical, chemical and biological phenomena in natural aquatic systems. Use of mathematical models for water quality control. *Spring*. Lauria.
- ENVR 272 **Engineered Water Systems (3)**. Prerequisite, permission of instructor. An examination of technology and planning techniques for water and wastewater systems including pumping stations, reservoirs, water distribution and wastewater collection networks. *Fall*. Lauria.
- ENVR 273 **Water and Wastewater Treatment Plant Design (3)**. Prerequisites, ENVR 174. The application of the theory of water and wastewater treatment to the design of municipal treatment facilities. The course includes the principles of design and modern design practices. The seminar is devoted to the design and analysis or design of specific works for water and wastewater treatment. *Summer*. Staff.
- ENVR 274 **Advanced Water and Wastes Treatment Processes I (3)**. Prerequisite, ENVR 127 or permission of instructor. The first of a 2-course in-depth presentation of the applications of chemical, physical, and biological principles to water and wastewater treatment. Process considerations including equilibria, kinetics and reactor performance are presented. Physical and chemical processes are highlighted including sedimentation, filtration, absorption, ion exchange, coagulation, precipitation. Laboratory exercises illustrate the process principles. *Fall*. Singer, DiGiano.
- ENVR 275 **Advanced Water and Wastes Treatment Processes II (3)**. Prerequisites, ENVR 274, ENVR 131 or permission of instructor. Continuation of ENVR 274 with emphasis on wastewater treatment processes including aerobic and anaerobic biological treatment, gas transfer, solids handling, nutrient removal, and membrane processes. Laboratory exercises are included. *Spring*. Singer, DiGiano.
- ENVR 276 **Industrial Water Quality Management (3)**. Prerequisites ENVR 171 and ENVR 174, or equivalent. Water supply and wastes disposal problems of industries. Special water quality requirements and treatment methods are reviewed in a comprehensive fashion. The nature of industrial wastes, pollutional difficulties resulting from their discharge, and methods of attacking wastes problems are discussed, including technical administrative and regulatory aspects. Emphasis

is placed on the diverse nature of these problems and the methodology employed in their solution. *Two lecture and two seminar hours a week, fall.* Lamb.

- NVR 277 Engineering Project Design (3).** Prerequisites, ENVR 271 and BIOS 135. Decision model approach to project design. Demand analysis. Dynamic aspects; flexibility, sequence and timing. Water distribution systems. Waste management systems. Application of analog and digital computers to sanitary engineering design. *First summer session.* Staff.
- NVR 278 Development of a Water Project (3).** Prerequisite, permission of instructor. Analysis of a real water project including data collection, preliminary design, evaluation of engineering alternatives, and assessment of feasibility culminating in the preparation of an engineering report. *Two lecture and two seminar hours a week, spring.* Okun.
- NVR 281 Topics in Advanced Hydrology (3).** Prerequisites, ENVR 272 and BIOS 135 or equivalent. Urban hydrology, hydrological frequency analysis, extreme value theory, analysis of low flows, problem of storage synthetic hydrology. *Spring.* Staff.
- NVR 282 Public Investment Theory and Techniques (3).** (PLAN 232). Prerequisites, ECON 131 and permission of the instructor. Study of new methods of economic, engineering, and governmental analysis in public investment planning. Techniques include those for converting broad community objectives into specific criteria to design public projects, with special emphasis on water resources. *Fall.* Moreau.
- NVR 283 Natural Resource Law and Policy (3).** (PLAN 233). Prerequisite, permission of instructor. An examination of the law of resource use and development, its administration and underlying policies. Particular attention to water rights law, regulatory law, and natural resource administration. Regulatory aspects of pollution control programs will be covered. *Fall and spring.* Campbell, Heath.
- NVR 284 Water Resources Planning and Policy Analysis (PLAN 234) (3).** Prerequisite, permission of the instructor. Introduction to water resources planning and management and the interrelationships between water and other natural resource systems. Emphasis will be on federal and state water resources policies and the development of analytical skills for the identification of environmental problems associated with the development of urban water resources and management strategies required to minimize environmental impacts.
- NVR 300 Research in Environmental Sciences and Engineering (2 or more).** Prerequisite, consultation with the faculty and approval of subject and proposed program. Research in environmental sciences and engineering for students outside the Department. *Four or more hours a week, fall, spring, summer.* Staff.
- NVR 301 Seminar in Environmental Sciences and Engineering (1 or more).** Readings and discussions to provide opportunity to develop new concepts in topics in various aspects of environmental sciences and engineering. *Fall, spring, and summer.* Staff.
- NVR 311 Seminar in Environmental Health (1).** Open by special arrangement to students doing advanced graduate work. Directed readings and reports on recent advances concerned with environmental health. Reports of current research and review of principal journals in environmental health, sanitary engineering and sanitary sciences. *Two seminar hours a week, fall and spring.* Staff.
- NVR 313 Environmental Health Problems in Developing Countries (1).** Selected problems relating to achievement of social, economic and technologic benefits in developing countries through improvement of the environment. Seminar topics; technical processes and innovation, institutions, modification of values and attitudes, planning and administration (general applications and specific case stud-

ies of environmental change). *Offered in alternate years beginning fall, 1981*. Shiffman.

- ENVR 314 **Seminar on Current Industrial Hygiene Issues** (1). ENVR 242, corequisite; permission of instructor required. Discussion on current topics affecting the field of industrial hygiene. *Two seminar hours per week, spring.* Reist.
- ENVR 320 **Research in Environmental Chemistry** (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Christman, Johnson, Shuman, Singer, Millington.
- ENVR 330 **Research in Environmental Biology** (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Kuenzler, Weiss, Pfaender, Sobsey.
- ENVR 340 **Research in Air and Industrial Hygiene** (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Battigelli, Fox, Fraser, Harris, Jeffries, Reist, Gold, Hickey.
- ENVR 341 **Engineering Research in Air and Industrial Hygiene** (1-9). Prerequisite, consultation with the faculty and approval of the subject and proposed program. *Fall, spring, summer.* Fox, Fraser, Harris, Jeffries, Reist, Hickey.
- ENVR 350 **Research in Environmental Management and Protection** (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Christman, Shiffman, Turner, Gold, Andrews.
- ENVR 360 **Research in Radiological Hygiene** (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Watson, Stansbury.
- ENVR 370 **Investigations in Water Resources Engineering** (1-9). Prerequisite, consultation with the faculty and approval of subject and proposed program. *Fall, spring, summer.* Lamb, Lauria, Okun, Briscoe, DiGiano, Singer.
- ENVR 392 **Master's Technical Report** (1-9). The technical report requirement for MSPH, MPH, and MSEE candidates is satisfied by the extensive study of a problem in environmental sciences and engineering. Study may extend over one or more semesters and credit is assigned accordingly.
- ENVR 393 **Master's Thesis** (1-9).
- ENVR 394 **Doctoral Dissertation** (3-9).
- ENVR 400 **General Registration** (0).

## Department of Epidemiology

- EPID 140 **Problems in Epidemiology** (1 or more). A course for students who wish to make an intensive study of some special problems in epidemiology. *Fall, spring, and summer.* Faculty.
- EPID 160 **Principles of Epidemiology** (3). Pre- or co-requisite, BIOS 101 or BIOS 105 or permission of instructor. An introductory course that considers the meaning and scope of epidemiology and the uses of morbidity, mortality and other vital statistics data in the scientific appraisal of community health. *Two lecture and two laboratory hours a week, fall.* Omran, faculty.
- EPID 161 **Epidemiology in Population Dynamics and Family Planning Programs** (2). Pre- or co-requisites, BIOS 101 and EPID 160, or their equivalents. Health and population dynamics: epidemiologic transition, health and family formation, fertility

regulation methods, infertility. Assessment of family planning programs. Emphasizes methodologic and content issues in international context. *Fall*. Omran.

- PID 162 **Epidemiology of Environmental and Occupational Health (3)**. Pre- or co-requisites, BIOS 105 and one year of calculus, or permission of instructor. Alternative to EPID 160 satisfying core requirements. Introductory course in history, principles and uses of epidemiology for understanding and control of health and disease in relation to man's environment. *Spring*. Shy.
- PID 165 **Analysis of Categorical Data (BIOS 165) (3)**. Prerequisites, BIOS 105 and EPID 160 or equivalents. Analysis of categorized data, with special emphasis on the methods of use in epidemiology; contingency tables, rates and relative risk, survivorship and life table methods, linear models for categorical data. *Spring*. Symons.
- PID 168 **Fundamentals of Epidemiology (3)**. Pre- or co-requisites, BIOS 105 or higher level BIOS course, and biomedical background. Permission of instructor required for nonmajors. Epidemiologic principles and methods with emphasis on topical issues and advanced research design and analysis. An alternate to EPID 160 for satisfying the SPH core requirements. *Two lecture and two laboratory hours a week, fall*. Ibrahim, Schoenbach, faculty.
- PID 170 **Epidemiology of Program Acceptance (3)**. Prerequisite, EPID 160 or equivalent. Use of epidemiological method to consider the problems of social, cultural, and psychological determinants of health programs. Concepts and methods useful in predicting patterns of acceptance or rejection. *Spring*. Patrick.
- PID 200 **Epidemiology for Clinicians (2-4)**. Prerequisite, clinical experience in medicine or of instructors. When taken for three or more hours, acts as alternative to EPID 160 satisfying core requirements. Introduction to epidemiologic principles and methods as applied to clinical practice. *Two lecture hours and two possible seminar or laboratory hours a week, spring*. Gehlbach.
- PID 211 **Determinants of Communicable Disease (2)**. Biological determinants, changing patterns of communicable diseases, definition of high-risk sub-populations, methods of control. *Fall*. Becker.
- PID 231 **Epidemiologic Research in Personal Health Services (3)**. Permission of instructor required for non-majors. Exploration of research methodology and measurement techniques in areas of quality of care and services utilization. Formation of research proposals by students. *Fall*. Hulka.
- PID 233 **Cancer Epidemiology and Pathogenesis (3)**. Prerequisites, EPID 160 or alternative. Background in pathology. Permission of instructor required for non-majors. Focuses on integrative approach to cancer epidemiologic investigation, choice of research strategies and comparison groups, hypothesis generation, data analysis and interpretation. Preparation of research proposals. *Spring*. Hulka, Rudnick.
- PID 234 **Research Design in Epidemiology (2)**. Pre- or co-requisite, EPID 160 or alternative. Systematic stepwise approach to research design. Epidemiologic methods and strategies in planning and interpreting etiologic studies; clinical and intervention trials; evaluation. Appraising validity of different designs. Grantsmanship and research proposals. *Fall*. Omran.
- PID 249 **Genetics of Common Diseases (Genetics 249) (3)**. Prerequisites, BIOS 150, GNET 122 or EPID 160, or permission of instructor. Critical analysis of genetic issues in human disease. The genetics of cancer, heart disease, diabetes, mental illness, mental retardation, hypertension and arthritis will be covered. The application of genetic and epidemiological techniques will be examined. *Spring*. (1982 and alternate years.) Swift.

- EPID 250 Health Problems of Black Americans: A Social Epidemiologic Perspective (3).** Prerequisites, EPID 160; BIOS 105. Examines major underlying socioeconomic cultural and psychological factors contributing to the observed black excess in deaths from hypertension-related disorders, cancer, alcoholism and homicide in early and middle adulthood. *Two lecture hours and two seminar hours a week Spring.* James.
- EPID 251 Epidemiologic Methods in Population (3).** Prerequisites, EPID 161 and/or permission of instructor. Uses, limitations of traditional epidemiologic strategies in population research. Advanced epidemiologic methodologies in the study of fertility and mortality correlates, abortion, sterilization, contraception, and sterility. Epidemiology in family planning evaluative research. Epidemiologic case studies in population. *Spring.* Omran.
- EPID 256 Cardiovascular Disease Epidemiology (3).** Pre- or co-requisites, EPID 160 and BIOS 105, or their equivalents. Review of major issues in cardiovascular disease epidemiology, summarization of relevant pathology and analogies of population determinants and strategies for prevention. *Fall.* Tyroler, Heiss, Davis.
- EPID 257 Teaching Experience in Epidemiology (4).** Prerequisites, EPID major, second year or above. Provides Epidemiology majors with supervised experience in teaching and course preparation. Students act as assistants in departmental courses. *Fall, spring, and summer.* Faculty.
- EPID 258 Women's Health: An Epidemiological Analysis (3).** Prerequisite, EPID 160. Permission required for non-majors. Critical exploration and research on factors associated with selected health states in women and health service utilization by women. Emphasizes examination of hypotheses on health correlates of women's role changes. *Spring.* Williams.
- EPID 264 Culture and Health (3).** Prerequisites, EPID 160 or equivalent, basic social science background, permission of instructor. The role of social, cultural and psychological factors in the etiology of various disorders. Emphasis placed upon the development of useful frameworks and on methods required to investigate these correlates of health. *Spring.* Kaplan.
- EPID 265 History of Epidemiology (3).** Prerequisite, EPID 160 or permission of instructor. This course considers the historical development of epidemiological knowledge and method in relation to changing patterns of health and the existing scientific "climate". *First session summer.* Patrick.
- EPID 266 Epidemiologic Investigation (3).** Prerequisites, EPID 160, EPID 256, BIOS 105, or their equivalents. Permission required. Designed for the acquisition of skills in epidemiologic research, through the investigation of problems in cardiovascular disease. Available data sets are used for tutored research. *Spring.* Heiss, Davis, Tyroler.
- EPID 267 Occupational Epidemiology (3).** Prerequisites, EPID 160, BIOS 105. Review of methods of investigation and epidemiologic evidence of diseases associated with the work environment. *Spring.* Tyroler, Shy, Checkoway, Andjelkovich.
- EPID 268 Advanced Methods in Epidemiology (4).** Prerequisites, BIOS 145, EPID 160, BIOS 108, or their equivalents. This course develops a systematic overview of the methodologic techniques available for observational and experimental epidemiologic investigation at the stages of planning, information and analysis. *Three lecture and two laboratory hours a week, fall.* Kleinbaum, Kupper.
- EPID 276 Advanced Environmental and Occupational Epidemiology (3).** Prerequisite, EPID 160 or 162 or equivalent; permission of instructor. Designed for epidemiology majors, this course investigates various applications of the principles of epidemiologic research to the evaluation and identification of environmental and occupational health hazards. *Fall.* Shy.

- EPID 301 Epidemiologic Research in Federal Agencies (1).** Prerequisite, EPID 160. Permission of instructor required. Field visit to D.C. area federal agencies conducting epidemiologic research. Supervised meetings with agency scientists to discuss epidemiologic studies. Oral and written report on research program of one agency required. No field fee. *Spring*. Shy.
- EPID 315 Field Training in Epidemiology (3-6).** Prerequisite, advanced standing. Designed to give epidemiology majors a supervised field experience in population health research. Field fee \$650.00. *Summer*. Faculty.
- EPID 360 Research in Epidemiology (2-9).** Prerequisite, permission of instructor. Independent investigation in consultation with an instructor who must assign or approve the subject of research. Credits will vary according to the effort and rigor of the research. *Fall, spring, summer*. Faculty.
- EPID 361**
- EPID 362 Environmental Epidemiology Seminar (3).** Detailed, critical reviews of selected topics in environmental epidemiology. Students work collaboratively with faculty members conducting research in environmental determinants of disease. *Spring*. Tyroler.
- EPID 368 Epidemiologic Basis of Community Health Services (2).** Prerequisites, basic course in epidemiology and biostatistics. Preference to students with practical experience in community health service. Application of epidemiologic principles and methods to community diagnosis, establishing health priorities and planning and evaluating health programs. Indices, classifications, strategies, utilization, screening, intervention and outcome of care practices. *Spring, 1983 and alternate years*. Ibrahim.
- EPID 392 Major Paper (1-6).** *Fall, spring and summer*. Faculty.
- EPID 394 Doctoral Dissertation (3-9).** *Fall, spring, and summer*. Faculty.
- EPID 400 General Registration (0).**

## Department of Health Education

- HEED 9 Freshman Seminar (3).** For freshmen only. A review of the nature of modern health problems and the roles of the individual, the community, the health professions and agencies in medical care and health maintenance. *Fall*. Boatman, Hochbaum.
- HEED 33 Topics in Human Sexuality (3).** Open to undergraduates, by permission of instructor. Interpersonal relationships, abortion and contraception; psycho-sexual development, marriage and responsibility; legal aspects of contraception, sex and abortion. *Fall and spring*. DeVellis, staff.
- HEED 50 Personal and Community Health Behavior (2).** Relation of living habits and practices to health maintenance, disease prevention and use of the health care system. *Fall*. Hochbaum.
- HEED 90 Field Training in Health Education (6-12).** Experience as a functioning health educator in a community setting under supervision. Credit will be related to work completed and time spent in the field setting. *Fall, spring, summer*. Boatman and staff.
- HEED 98 Readings in Health Education (3-6).** Directed readings or laboratory study. Written report required. *Six to twelve hours a week, fall, spring and summer*. Staff.
- HEED 99 Honors in Health Education (3-6).** Prerequisite, HEED 98. Directed research. Written report required. *Six to twelve hours per week, fall, spring and summer*. Staff.

- HEED 101 **Aging and Human Development (3)** (PHNU/HADM/NUTR). Biological, medical, demographic, and social aspects of aging. New methods and concepts of aging processes and their implications. *Fall*. Staff.
- HEED 102 **Community Organization for Health Education (3)**. Introduction of community organization in community health education and implications for the function of the community health educator. (Permission required for non-majors). *Two lecture and two laboratory hours per week, fall*. Barnhill, staff.
- HEED 103 **Methods and Materials in Health Education (3)**. Methods and materials in school and community health education practice. Required for all undergraduate majors. *Two lecture and two laboratory hours per week, fall*. Staff.
- HEED 104 **School Organization for Health Education (3)**. Introduction to school health education and administration including components and organization of a comprehensive school health program, curriculum design and evaluation. (Permission required for non-majors). *Two lecture and two laboratory hours a week, spring*. Barr.
- HEED 108 **Minority Health and Health Services Delivery (2)**. The life experiences of ethnic minorities in the United States with special reference to the implications for their participation in health programs. *Spring*. Hatch.
- HEED 109 **Rural Health and Community Action (3)**. Permission of instructor. Community education and action as modes of intervention in rural communities. Cross-cultural perspectives of rural health development. *Three seminar hours a week*. Hatch.
- HEED 120 **Promoting Health in a College Setting (3)**. Lectures and seminars on planning, implementing and evaluating health education programs in a college setting with an emphasis on health promotion and wellness. *Two lecture, two seminar hours per week*. Minuto.
- HEED 121 **Health Promotion Practicum (3)** Prerequisite, HEED 120. This field placement in the Student Health Service will provide an opportunity to implement skills learned in HEED 120. *Nine laboratory hours a week*. Minuto.
- HEED 130 **Principles of Health Education (2)**. For majors only. The relationship between human behavior and health; natural and planned change in health-related behavior in the individual, small group and community; principles of program design and evaluation; the role of the client. *One lecture and two seminar hours per week, fall and spring*. Dawson.
- HEED 131 **Health Education in Public Health (2)**. Determinants of health-related consumer and provider behaviors and means to promote behavioral change by working with individuals and communities, with focus on problems encountered by various health professionals. For non-majors. *Spring*. Hochbaum.
- HEED 133 **Interpersonal and Group Relations (3)**. Prerequisite, permission of instructor. An experimental study of human relations with emphasis on analysis of interpersonal and group interaction, the effective use of intervention in group problem solving, leadership styles and team building, inter-group cooperation and conflict. *Two lecture, two laboratory hours, fall and spring*. Staff.
- HEED 140 **Problems in Health Education (1 or more)**. Prerequisites to be arranged with the faculty in each individual case, depending upon the problem that is to be studied. A course for students of public health who wish to make an intensive study of some special problem in public health education. *Fall, spring and summer*. Staff.
- HEED 150 **Group Dynamics & Discussion Group Leadership: Human Sexuality (4)**. Permission of instructor. Prerequisites, HEED 33 or graduate status. Interpersonal and

group interaction, theory and practice. Design and application of training exercises. Focus on leadership in group dealing with human sexuality. Students lead discussions of small groups of students in HEED 33. (Topics in Human Sexuality). *Fall, spring.* DeVellis, staff.

- EED 160 **Introduction to Women's Health and Health Education** (3). Using a lecture-discussion format, this course provides an overview of women's health-specific interests as family and community members, as patients and as health professionals. Implications for health education practice as well as opportunities for future research will be emphasized. *Two lecture and two seminar hours per week, fall.* Earp.
- EED 171 **Social Psychological Theory Applied to Issues in Patient Education** (3). Selected social psychological theories will be studied in depth and related to understanding and modifying the attitudes and behaviors of patients and health professionals. *Two lecture and two seminar hours per week, fall.* DeVellis.
- EED 172 **Principles and Practice of Patient Education** (2-3). Principles and practice of implementing, coordinating and evaluating patient education programs. *Two lecture hours per week (3 hour credit will be granted on the basis of a relevant research activity approved by instructor), spring.* Hochbaum and DeVellis.
- EED 180 **Mental Health Promotion: Social and Behavioral Change Approaches** (3). Critical review and evaluation of programs targeted at individuals, families, interpersonal networks, communities and larger social units which have the promotion of mental health as a goal. *Three hours per week, spring.* Thomas.
- EED 190 **Psychological Aspects of Aging** (3). Psychosocial aspects of the aging process and of old age. Needs of the elderly and their reactions to agencies and programs for the aged. *Two lecture and two seminar hours per week, spring.* Hochbaum.
- EED 200 **Special Studies in Behavior Change** (1 or more). Prerequisite, permission of instructor. HEED 200-natural change process in health-related behavior; HEED 201, 202, 203, 204, 201-planned change; personal and non-personal methods. HEED 202- program design and evaluation; HEED 203 personal development and community action; HEED 204-social class and culture variations in planned change. *Fall, spring and summer.* Staff.
- EED 206 **Education and Social Change in Population Planning** (2). Permission of instructor. The study of social and behavioral factors in the adoption of new practices; cross-cultural analysis and planning for the educational aspects of population control programs including implementation, evaluation, and training of personnel. *Two laboratory hours per week, spring.* Whitehead.
- EED 208 **Units of Practice I: Family and Kinship Systems.** (3). Permission of instructor. The relationship of family and kinship patterns to health behavior; implications for planned change. Whitehead, staff.
- EED 209 **Units of Practice II: Individual, Small Group and Network** (1-3). Corequisite, enrollment in HEED 241 or permission of instructor. Behavior systems in the individual, small group, family and other styles for planned change in personal health-related behavior, interpersonal and non-personal methods. *Fall and spring.* Staff.
- EED 210 **Units of Practice III: The Community** (1-3). Corequisite, enrollment in HEED 241, or permission of instructor. The nature and delineation of communities as social systems; theories, principles and practices relevant to health-related community development process; the identification of formal and informal leadership and power structures, etc. *Two lecture and seminar hours per week, fall, spring and summer.* Dawson.

- HEED 211 Units of Practice IV: Social Policy and Large Populations (1-3).** Health education social policy roles and strategies. The nature and delineation of policy and large populations as units of health education practice; includes field practicum. *One three seminar, one-three laboratory hours per week, spring.* Steckler, Dawson.
- HEED 212 Citizen Participation in Community Health Decision Making (1-4).** Permission of instructor. Theories and concepts of citizen participation in community health settings; an historical review of mandated citizen participation; and strategies for enhancing citizens' ability to influence the social policy process. *One-three lecture hours; 0-two seminar hours per week, fall.* Steckler.
- HEED 222, 223 Professional Practice (1 or 2).** Corequisite, enrollment in HEED 242 or permission of instructor. Studies in the professional role of the change agent and consultant with special reference to cross-cultural settings; the development of the professional and sources of innovation and practice. *Spring.* Steuart, staff.
- HEED 230, 231, 232 Cross-Cultural Consultation (1-3).** Permission of instructor. Enrollment required in total series. The process and content of cross-cultural and international consultation in technical assistance to developing country health programs with special reference to planned social and behavioral change. *Fall, spring and summer.* Steuart.
- HEED 234 Team Problem Solving (1 or more).** Prerequisites, HEED 133 or permission of instructor. An experimental study of interpersonal relations in professional team settings; intra- and inter-team relationship process to large social systems with emphasis on intervention techniques. *Spring.* Staff.
- HEED 235, 236 Instructional Materials and Development (1-3).** Permission of instructor. Independent projects in the design, production, validation and utilization of self-instructional training materials for use in college courses, in-service training programs, patient education, etc. Students may arrange for credit proportionate to the complexity of the individual projects. *Fall and spring.* Stritter, staff.
- HEED 240 Field Work: Introduction to Community Action (2 or more).** Corequisites, HEED 130, HEED 133 or permission of instructor. Establishing client-professional relations; community group development and participation in planning; preliminary analysis of selected demographic, social, cultural and epidemiological features of the community needs. Field fee, \$450. *Fall.* Dawson, staff.
- HEED 241 Field Work: Program Planning and Design (2 or more).** Prerequisite, HEED 240 or permission of instructor. Data-collection and analysis relevant to program objectives, methods and evaluative research with associate community group participation in planning and implementation. *Spring.* Dawson, staff.
- HEED 242 Field Work: Program Development and Community Action (2 or more).** Prerequisite, HEED 241 or permission of instructor. Client-professional partnership in community action in selection design of techniques for health-related behavior change in program evaluation. *Summer.* Dawson, staff.
- HEED 243 Field Work: Advanced Community Health Development (2 or more).** Prerequisite, HEED 242 or permission of instructor. Client and professional consultation in community health development, in personnel development and supervision of non-professional and professional community health workers. *Fall.* Dawson, staff.
- HEED 244 Field Work Evaluation (2 or more).** Prerequisite, HEED 243 or permission of instructor. Studies of change processes in the community setting and evaluation of the effectiveness of the role of the change agent. *Spring.* Dawson, staff.
- HEED 250, 251, 252 Research Methods in Health Education (1-3).** Corequisite, enrollment in HEED 241, 242, 243, or permission of instructor. Introduction to research and evaluation methods of particular relevance to planned change in health-related behavior. *Two or more hours per week. Fall, spring and summer.* Earp, staff.

- HEED 253 Natural Change Determinants in Health-Related Behavior (3).** Permission of instructor. An integrated behavioral science approach to unplanned determinants of change in the health-related behavior systems of the small individual, group, and community. *Fall.* Steuart.
- HEED 254 Personnel Development (1-3).** Corequisite, enrollment in HEED 234, or permission of instructor. The study of training and supervision as processes for personnel development in programs of planned change; training system strategies, design, teaching styles, methods and evaluation; the personnel development role in supervision, effects of organizational climate, etc. *Fall and summer.* Staff.
- HEED 310, 317 Doctoral Seminars in Health Education (1-3).** Prerequisite master's degree. Permission of instructor for non-majors. A series of seminars designed to explore the scientific foundations of health education and their implications for health education practice. *Two to six seminar hours a week, fall, spring and summer.* Staff.
- HEED 340 Advanced Field Training in Health Education (8).** Under the guidance of faculty and field counselors, students in this course may assume major responsibility in field centers for a special phase of public health education—program planning and development, intensive studies and surveys of problem situations, evaluations, inservice training, etc.—or for a community-wide program on a temporary basis. Open only to advanced graduate students who have been engaged in public health education at least two years beyond completion of the master's program. Field fee \$450. *Fall and spring.* Staff.
- HEED 350, 351, 352 Advanced Research in Health Education (2-9).** Permission of instructor. Available only to students capable of pursuing independent research projects under supervision. *Four to eighteen laboratory hours per week, fall, spring and summer.* Staff.
- HEED 392 Master's Paper (1-6).** *Fall, spring and summer.* Staff.
- HEED 394 Doctoral Dissertation (3-9).** *Fall, spring and summer.*
- HEED 400 General Registration (0).**

## Department of Health Policy and Administration

- HPAA 75 Introduction to Health Services Systems (3).** Introduction to social, political, and economic rationale for, and patterns of, health services delivery at all levels of government: international, national, state, and local. *Fall.* Flash, staff.
- HPAA 76 Introduction to Health Organization Behavior (3).** Basic concepts of organizational theory, organizational development, and administrative behavior as applied to the field of health. *Fall.* Files.
- HPAA 77 Budgeting and Control for Health Programs (3).** Basic methods and techniques of management and control of health programs, as well as resource development. *Fall and spring.* Loddengaard.
- HPAA 90 Field Training in Health Administration (3).** Supervised field experience in approved health agencies. Field fee \$200.00. *Fall, spring, summer.* Staff.
- HPAA 98 Readings in Health Administration (3-6).** For undergraduates enrolled in the Department's bachelor's degree program. Permission of instructor required. Directed readings or research; written reports are required. *Fall, spring, summer.* Staff.

- HPAA 99 **Honors Research** (6-9). Prerequisites, overall GPA 3.3 by end of junior year in all UNC-CH courses, permission of Department chairman. Readings and seminars for undergraduates who show potential and talent to do research. Students will carry out a special project and prepare an honors thesis based on the project. *Fall, spring, summer.* Staff.
- HPAA 101 **Aging and Human Development** (PHNU/HEED/NUTR) (3). Biological, medical, demographic and social aspects of aging. New methods and concepts of aging processes and their implications. Staff.
- HPAA 102 **Determinants of Health: Biological, Physical and Social Factors** (MHCH 102 (1-3)). Role of various biological, physical and social factors in health. The course will be taught in three autonomous modules. *Spring.* Rozier, Watkins and staff.
- HPAA 105 **Concepts of Health Administration** (3). Survey of health and human services organization and management including concepts of administrative systems, government, legal and public interest aspects, organizational behavior and relations. *Fall and spring.* Allen, Barry.
- HPAA 109 **Concurrent Field Training in Health Administration** (1-3). Supervised observation of service activities in health service organizations. *Fall and spring.* Staff.
- HPAA 113 **Hospitals and Nursing Homes** (3). Prerequisite, permission of instructor. Hospital care, organization, monitoring, costs, and financing. Exploration of trends and issues such as cost controls, productivity, quality assurance, medical staffing and organization, regional organization, other countries. *Fall.* Rosenfeld.
- HPAA 119 **Planning of Community Health Services** (3). Prerequisite, permission of instructor. A simulation exercise in developing a community health program supported by lectures and seminars leading to class presentation and critiques. *Fall, spring.* Grubb.
- HPAA 126 **Introduction to Population Policy** (3). Concepts of population policy in the context of social policy, policy implications of population dynamics, policy issues and alternatives, and studies in policy development processes. *Fall.* Freymann.
- HPAA 131 **Methods of Interorganizational Coordination** (3). An examination of selected methods of interorganizational coordination with special attention given to the interorganizational context of health and human services provider agencies. *Fall.* Files, Jain, Schaefer.
- HPAA 133 **Issues in Health Care** (1-2). By means of presentations by national leaders in health care and of class discussions, problems and issues and changes in public policy in health care will be explored. *Spring.* Freund.
- HPAA 137 **State and Local Public Health Programming** (2). Current trends in function/programs of health departments with special reference to responsibility and relationships to citizens, health professionals, public officials and governing boards. *Spring.* Koomen.
- HPAA 140 **Readings in Health Administration** (1-6). Staff.
- HPAA 147 **Population Program Development and Administration** (3). Offers basic knowledge, methods and skills required to plan, implement, administer and evaluate fertility control programs. Utilizes discussions, readings, planning exercises, and a computer game. *Spring.* (Alternate years.) Loddengaard.
- HPAA 153 **Health Care Costs and Financing** (3). No prerequisites. Analysis of trends in utilization of services, costs, sources and methods in health financing. Extensive review of multiple socioeconomic and geographic factors affecting costs. Examination of the evolution and trends in third party payment (insurance) mechanisms. *Fall and spring.* Rosenfeld.

- HPAA 156 **Strategies for Prevention** (3). Effects of public policies on rates of illness, injury, and premature death. Advantages and disadvantages of various approaches to prevention, especially regulation and health promotion. *Spring*. Barry.
- HPAA 158 **Ethical Issues in Medicine and Health** (3). Nature of ethical thought and reasoning; contributions of religion and science; historical and current issues. Sections on professional practice issues and health policy issues. *Fall, spring*. Allen, Beauchamp.
- HPAA 165 **Women in Management** (3). Analysis of current status of women in management in corporate health and governmental settings in the U.S. Contributions of social sciences to understanding problems in women achieving full equality with male managers. *Fall and spring*. Allen.
- HPAA 167 **Introduction to Dental Public Health: Basic Knowledge and Skills** (2). Survey of the theory practice of dental public health, epidemiology and natural history of dental disease, dental indices, methods of prevention and control on population groups. *Fall*. Hughes, Rozier.
- HPAA 168 **Structure and Functions of Human Services Systems** (Human Services Administration 168) (3). Describes development of human services in U.S. with exploration of functions and practices in categorical service systems. Considers feasibility of integrating functions into more comprehensive service system. *Fall*. Files, Koomen.
- HPAA 175 **Policy Initiatives for the Aging** (3). Presentation and review of existing and developing policies affecting the aging population in the U.S., with some international comparisons. *Spring*. Phillips.
- HPAA 176 **Long Term Care Administration** (3). Current status of delivery of services and characteristics of long term care institutions and alternatives to institutional care. *Fall, spring*. Rosenfeld.
- HPAA 181 **Interpersonal and Group Relationships in Administration** (3). Didactic and experiential learnings of personal understandings and skills the administrator needs in order to create effective interpersonal work relationships and group functioning in a service organization. *Fall*. Edgerton.
- HPAA 182 **Managerial Aspects of Financial Management of Health Organizations** (3). Finance and accounting concepts and techniques applicable to managing resources in health organizations, with emphasis on budgeting and control. *Spring*. Zelman.
- HPAA 183 **Management of Human Resources in Health Organizations** (3). Permission of the instructor required. Basic knowledge and skills in managing people in health organizations: philosophy, productivity, assessment, managerial skills, and support systems. *Spring*. Herzog.
- HPAA 185 **Financial Administration of Health Care Institutions**. (3). Working capital management, budget process and short/long term financing in managing health care organizations. *Fall, spring*. Zelman, Suver.
- HPAA 187 **Survey of Mental Health Programs** (3). A survey of the development and organization of mental health services available to the public. Selected readings and field observations. *Fall*. Luckey.
- HPAA 188 **Health Law** (3). Familiarization with nature, perspective and objects of the legal process. Provides skills in understanding legal terminology, legal reasoning and the tools of law, particularly for application to health care management and in making health policy decisions. *Fall, spring*. Wing.

- HPAA 189 **Development of Personal Effectiveness** (3). Prerequisite, permission of the instructor. This course undertakes experiential learning and self-assessment to help health practitioners and administrators realize their own rational capabilities. A peer-counseling approach is used to help increase: (a) awareness of how personal feelings and those of others affect the ability to behave rationally; and (b) the ability to deal with feelings in ways that lead to rational behavior. *Fall, spring*. Flash.
- HPAA 190 **Legal Problems in Health Facilities Administration** (3). Prerequisite, HADM 188 or permission of instructor. Study of legal problems in the administration of hospitals, nursing homes, and other health facilities, and their relation to health policy. *Spring*. Wing.
- HPAA 195 **Implementing and Managing Change in Health Organizations** (3). Prerequisite, permission of instructor. Alternative strategies of implementing and managing change within health organizations. Analytical models from systems approach, interpersonal dynamics, politics. Case discussions, exercises, student participation. *Fall, spring*. Herzog, Allen.
- HPAA 200 **Quantitative and Analytical Methods for Health Administration** (3). Prerequisite, permission of instructor. Introduction to process of decision modeling, emphasizing formulation, application and computation of basic management science models in health administration. Includes decision theory, economic analysis and linear programming. *Spring*. Parker.
- HPAA 201 **Research Methods in Health and Health Services** (3). Prerequisites, BIOS and passing qualifying mathematics examination in HPAA. Examination of available methodology in terms of its application to researchable problems in health administration. Provides directed supervision of students carrying out empirical research. *Fall*. Veney.
- HPAA 202 **Issues in Health Administration** (1-6). *Fall, spring*. Staff.
- HPAA 204 **Policy for Alcohol and Other Drugs** (3). Examinations of the issues in formulating and implementing policy for drug problems, including alcohol. Conceptual frameworks for understanding the etiology of drug problems and intervention strategies. *Fall*. Beauchamp.
- HPAA 206 **Field Work in Health Administration** (1 or more). This course provides an opportunity for supervised field operation and experience in approved health agencies. Field fee, \$450.00. *Spring, summer*. Staff.
- HPAA 207 **Evolution, Organization and Financing of Health Systems** (3). Societal, technological and professional forces in the evolution of health systems, current organizational and financing pattern, and various emerging issues. *Fall, spring*. Rosenfeld, Allen, Jesse.
- HPAA 208 **Health Policy and Law** (3). This course addresses the analytic and action roles in health policy for health administrators and more specialized policy positions. The course addresses recent formative trends in public policy as well as substantive health policy issues. Attention is given to the dynamics and strategies of the public policy process including: the spectrum of actors and structures; the process by which health problems are defined as issues, the policy formulation and implementation processes, regulatory policy making, and the legal bases and practical constraints of law in health policy formulation and implementation. *Spring*. Beauchamp, Flash, Wing.
- HPAA 209 **Fundamentals of Health Administration** (3). General introduction to health management concepts and methods in relation to managerial role, program planning, implementation and evaluation. *Fall*. Jain.

- HPAA 210 Health Management Methods I (3).** Conceptual and methodological learnings in management of health sciences programs and agencies; includes examination of administration processes and methods of program planning, program implementation and program control. *Fall.* Schaefer, staff.
- HPAA 211 Health Management Methods II (3).** Prerequisites, HPAA 210 and permission of instructor. Continuation of HPAA 210; includes methods of personnel and management, communication and coordination. *Fall, spring.* Herzog, staff.
- HPAA 212 Fundamentals of Health Administration II (2).** A continuation of HPAA 209. Course will focus on treatment and correction of organizational pathologies. *Spring.* Jain, staff.
- HPAA 217 Theory and Methods of Health Planning and Evaluation (3).** Prerequisite, HPAA 210 or 147. Theory of planning and evaluation methods, developed through experiential learning in the planning of health programs and design of program evaluation. *Fall, spring.* Schaefer.
- HPAA 218 Planning Family Health Programs (MHCH 218) (3).** Permission required for non-majors. Basic models and methods of program planning. Emphasis on application of methods through the development of program plans for significant family health problems. *Spring.* Peoples.
- HPAA 220 Areawide Health Planning (3).** Prerequisite, permission of instructor. A perspective on the legal background, processes and products of areawide health planning, with special reference to current issues. *Fall.* Phillips.
- HPAA 221 Health Manpower Planning: Methods and Issues (3).** Prerequisite, permission of instructor. Topics include: manpower study design, planning methods, new careers, distribution, productivity, training and manpower utilization. Case examples and practical exercise in planning. *Spring.* Bacon.
- HPAA 222 Organizational Diagnosis and Development (3).** Prerequisites, HPAA 296 and permission of instructor. A skill application course which emphasizes the social/psychological aspects of development and change in complex organizations. Topics will include the utilization of conflict and the role of negotiation in change. *Fall, spring.* Neely, Jain.
- HPAA 223 The Politics of Health Organizations (3).** Prerequisite, HPAA 208 or permission of instructor. A view of health agencies from the perspective of the competitive struggle for public support. Topics covered include: the concept of public support; the constituencies of health organizations; leadership, expertise, values and public policies are generators of public support. *Fall.* Beauchamp, Flash.
- HPAA 224 Some Quantitative Methods of Planning and Evaluation (BIOS 224) (3).** Planning cycle, methods overview, data sources, PERT, budgeting, health indices, measurement of goal fulfillment, achievement, efficiency, effectiveness, research designs, benefit cost analysis, probability, utility and decision trees. *Spring.* Gillings, staff.
- HPAA 225 Health and Management Information Systems (3).** Basic concepts of Management Informations Systems, with emphasis on their application to hospitals and health care settings, from a management science approach. *Fall.* Parker.
- HPAA 226 Health Care Quality and Utilization Control (3).** Evolution and current status of health care quality assurance systems and program for utilization control. Includes discussion of alternative quality assurance methods; PSRO's: hospital accreditation; hospital and ambulatory care utilization studies. *Spring.* Jessee.

- HPAA 227** **Ambulatory Care and Related Services** (3). Prerequisite, HPAA 207 or permission of instructor. Review of experience, current status, trends, and public policy relating to ambulatory health care and such related services as home care, day care, screening, and mental health screening. *Spring*. Rosenfeld.
- HPAA 228** **Administrative Epidemiology** (3). Review and analysis of cases dealing with the process of how community problems and technological data are used in the development of program strategies, evaluations and plans. Sections may be organized around minority group needs, mental health, family planning, animal-related health problems, and similar interest areas. *Spring*. Hines, staff.
- HPAA 230** **Planning Consumer Health-Oriented Programs** (3). Policy/program options and implementation strategies in the light of contemporary patterns of illness and the efficacy of modern health improvement interventions. *Spring*. Milio.
- HPAA 234** **Injury Control Policy and Program Administration** (3). Social economic and political issues in injury control. Course material drawn from federal, state and local intervention programs including occupational safety, highway safety, product safety, and poison control. *Spring*. Barry, Waller.
- HPAA 240** **Epidemiology of Alcohol Use and Abuse** (3) (EPID 240). Course will examine patterns of alcohol use and abuse nationally, internationally, and ethnically. Problems of definition, measurement and methodology will also be considered; as well as implications for health. *Two lecture, two seminar hours per week, spring*. Magruder-Habib.
- HPAA 253** **Operations Research and the Health System** (3). Prerequisite, permission of instructor. Analysis of deterministic and stochastic models and their applicability to health services research. Formulation of decision models for health care problems, involving mathematical programming, simulation and heuristics. *Fall*. Parker.
- HPAA 255** **Public Policy Analysis for Health** (3). Prerequisites, HPAA 208 and permission of instructor. This course reviews issues in the analysis and design of public policy for health. Topics will include policy and ideology; public vs. private, majority vs. minority, individual vs. collective issues, the uses and assumptions of formal techniques, such as cost benefit analysis, systems analysis and social policy analysis. *Fall*. Beauchamp.
- HPAA 263** **Dental Public Health Practice** (3). Dental care in the comprehensive health services setting, financing and payment, social and behavioral science applications, emerging role of auxiliary personnel, prevention and health education, organization and care delivery, professional regulation and accountability, role of health department and community dentistry in the academic setting. *Spring*. Hughes, Rozier.
- HPAA 266** **United States Health Policy** (MHCH 266) (2-3). Examination of policy issues pertaining to delivery of health services in the U.S. Evolution and current developments are examined in an effort to evaluate the administrative implications of current and proposed systems of health delivery in the U.S. *Fall, spring*. Miller, Allen.
- HPAA 282** **International and Comparative Health Administration** (3). Prerequisites HPAA 207, 208, and 210. Analytical descriptions of (1) national health systems of selected countries, developed and developing, and (2) U.S. and international efforts in promoting health development in the less developed countries. *Spring*. Schaefer, Freymann.
- HPAA 287** **Health Program Leadership** (3). Explores the personnel skills and approaches required of the administrator in developing and operating health programs, using community mental health center leadership as the major example. *Fall*. Hollister.

- HPAA 293 **Health Policy and the Governing Process: Executive, Legislative, and Judicial** (3). Prerequisite, HPAA 208 or permission of instructor. This course examines the political ideology, structures, and processes through which health policy issues are generated, legislated, adjudicated and administered at local, state, national, and international levels of governance. *Spring*. Flash.
- HPAA 295 **Management of Organizational Dysfunctions** (3). Prerequisite, HPAA 287. Focus on administrator's role in remediation or prevention of behavioral and relationships problems with clients, staff, and other agencies. Includes problem solving and skill practice laboratories. *Spring*. Hollister.
- HPAA 296 **Organizational Behavior of Health Institutions** (3). Review of theory and empirical findings providing approach to management and organizational behavior. Topics include effect of technology and size on organizational structure, performance, roles of professionals. *Fall and spring*. Kaluzny, Herzog, Files, Neely.
- HPAA 300 **Doctoral Seminar in Health Management I** (3). Prerequisite, doctoral standing. Readings and discussion of various aspects of health services. Special emphasis is given to the inter-relationships of administrative and organizational theory to selected health service topics. *Fall*. Kaluzny, staff.
- HPAA 301 **Doctoral Seminar in Health Management II** (3). Prerequisite, HPAA 300. Continuation of HPAA 300. *Spring*. Kaluzny, Schaefer.
- HPAA 304 **Seminar in Teaching of Health Administration** (3). Problems and processes of teaching health administration, including supervised practicum experiences. *Fall, spring*. Kaluzny, staff.
- HPAA 305 **Curriculum Development in Health Administration** (3). Prerequisite, doctoral standing or permission of instructor. Seminar in technologies of needs assessment, content analysis, objective setting and evaluation as applied to conventional and non-traditional programs in health administration education; historical and comparative approaches. *Fall, spring*. Schaefer, Herzog, staff.
- HPAA 311 **Selected Topics in Health Financial Management** (3). Prerequisite HPAA 211. Selected issues in health financial management such as Uniform Accounting and Reporting reimbursement; advanced budgeting techniques; Internal Control, etc. Students apply concepts to specific areas of interest. *Fall*. Zelman.
- HPAA 317 **Management and Organizational Issues in Mental Health** (3). Prerequisites, HPAA 187, 210 or permission of instructor. Deals with selected issues like integration of mental health in human services departments, federal-state-local funding mix, changing professional roles and similar other issues. *Spring*. Luckey.
- HPAA 333 **Advanced Methodology in Health Administration Research** (3). Prerequisites, BIOS 145 and HPAA 201, or permission of instructor. Research methodology as applied to understanding problems in health care delivery. Consideration is given to experimental design, data collection, and application of appropriate modes of analysis of data. *Spring*. Veney.
- HPAA 334 **Selected Topics in Health Administration: Advanced Seminar** (3). Prerequisite, permission of instructor. Integrative study of selected theory and research as it relates to the organization and delivery of health services. Separate seminars are developed to correspond to the doctoral student's specific interests and needs. *Spring*. Staff.
- HPAA 373 **Seminar in Health Administration** (1 or more). *Fall, spring and summer*. Jain.
- HPAA 384 **Advanced Studies in Population Policy** (3). Prerequisite, permission of instructor. Individualized studies on special problems in population policy analysis and development to provide skills in aspects of goal identification, analyzing relevant organizational processes. *Spring*. Freymann.

- HPAA 392 **Master's Paper (1-3).** Staff.
- HPAA 393 **Master's Paper (1-6).** Staff.
- HPAA 394 **Doctoral Dissertation (3-9).** Staff.
- HPAA 400 **General Registration (0).** Staff.

## Department of Maternal and Child Health

- MHCH 103 **Reproductive Physiology and Conception Control (2).** Human sexuality, reproductive physiology, methods of regulation; pregnancy, fetal wastage, infertility, sterilization, abortion and community responsibilities discussed. *Fall.* Hulka.
- MHCH 105 **Developmentally Handicapped Children and Their Families: An Interdisciplinary Approach.** (SOWO 105) (Physical Therapy 105). (3). Permission of instructor. Provides content on the range and complexities of developmental disabilities; presents a model of interdisciplinary diagnosis and management of developmental disabled children and their families. Lecture and discussion. Individual and group projects. *Fall, spring and summer.* C. Knobeloch and DDDL staff.
- MHCH 110 **Seminar in Current Issues in Women's Health (3).** Seminar course dealing with issues relating to changing roles of women and parents, with implications for individual family and community and for the well-being of children. Consideration is given to women health providers and developments in health care. *Spring.* Staff.
- MHCH 140 **Problems in Maternal and Child Health (1-3).** Prerequisites to be arranged with the faculty in each individual case. *Spring and summer.* Staff.
- MHCH 141, 142
- MHCH 200 **Issues in Maternal and Child Health Today (3).** For students outside the Department of MCH who desire an overview of content and programs in maternal and child health including family planning. Emphasis will be directed to contemporary approaches to promoting health and providing services for families. *Two lecture, two seminar hours, spring.* Kotch, Swenson.
- MHCH 208 **Concurrent Field Training in Maternal and Child Health (1-4).** An elective faculty supervised field experience in community maternal and child health services in relation to background of experience, special interest, and future professional plans. *Variable number of laboratory hours per week, fall, spring and summer.* Staff.
- MHCH 209 **Processes of Health Service Program Development (2).** Non-majors require permission of instructor. Through review of health service program characteristics, and analysis of the processes by which they came about, students will acquire understanding for preparation of a proposal for an MCH program, or some aspect of one, for a specific community. *One lecture and two seminar hours per week, fall.* Miller.
- MHCH 210 **Maternal and Infant Health and Family Planning (2).** Non-majors require permission of instructor. Health needs, problems and programmatic issues in maternal-infant health and family planning. Includes biologic, sociocultural and psychological factors. *One lecture, two seminar hours, fall.* Siegel, Watkins.
- MHCH 211 **Family and Child Health (2).** Permission of instructor required for non-majors. This course addresses the major issues in child and adolescent health in developmental sequence and interactions among children, their families and environment in relation to delivery of health services. *One lecture and two seminar hours a week, spring.* Watkins, Kotch.

- MHCH 212 Seminar on the Family** (PHNU 212) (1). Permission of instructor required. Family theory, research and assessment; family relationships and environments that influence adult and child health and development; professions and institutions that influence family functioning. *Two seminar hours a week, spring.* Schaefer.
- MHCH 213 Research Utilization in Maternal and Child Health** (2). Emphasis is upon evaluating the research methodology used by others and applying that research to the assessment, planning and implementation of policies and programs in maternal and child health. *Spring.* Bauman.
- MHCH 214 Field Training in Maternal and Child Health** (2-8). Required of selected students in terms of their background of experience, special interests, and future professional plans. An additional field fee of \$450.00 will be assessed. *Summer, 6-10 weeks.* Staff.
- MHCH 215 Child Health Assessment and Care** (PHNU 215) (2). Prerequisite, permission of instructor. Seminar series which emphasizes theoretical, conceptual and practice bases fundamental to assessment of infants and young children in community settings. Focus is upon wellness care and management of common and longterm childhood conditions. *Spring.* Adams.
- MHCH 217 Child Health: Nursing Intervention** (PHNU 217) (1-6). Prerequisite, permission of instructor. For nurses with appropriate theoretical and experiential backgrounds in child health and development. Emphasis is upon nursing practice with infants, young children and their families in a variety of community settings throughout North Carolina. *Spring.* Adams.
- MHCH 218 Planning Family Health Programs** (HPAA 218) (3). Permission required for non-majors. Basic models and methods of program planning. Emphasis on application of methods through the development of program plans for significant family health problems. *Spring.* Peoples.
- MHCH 220 Antepartal Theory: Assessment and Care of Pregnant Women** (PHNU 220) (2). Theoretical basis of antepartal care emphasizing the concept of risk and assessment of maternal and fetal well-being. *Fall.* Staff.
- MHCH 221 Antepartal Assessment and Care of Pregnant Women: Clinical Practice** (PHNU 221) (3). Prerequisites, permission of instructor. Corequisite, MHCH 220. Initial and on-going assessment of pregnant women including physical and pelvic examinations. Designed for nurses. *Spring.* Staff.
- MHCH 222 Family Planning Theory: Assessment and Care of Women in the Reproductive Years** (PHNU 222) (1). For health professionals doing family planning counseling. Includes mode of action, effectiveness, contraindications, side effects, complications, advantages, disadvantages of temporary and permanent methods of birth control. *First summer session.* Staff.
- MHCH 223 Family Planning Assessment and Care: Clinical Practice** (PHNU 223) (2 or 3). Prerequisites, permission of instructor. Corequisite. MHCH 222. Initial and ongoing assessment of women requesting or utilizing temporary birth control method. Nurse students competent in performing physical and pelvic exams, 2 credits; other nurses, 3 credits. *Second summer session.* Staff.
- MHCH 224 School Age Population: Health Problems and Programs** (3). (PHNU 224) Permission of instructor required. Health needs and problems of school aged population. Development and evaluation of programs to meet these needs including examination of legislative mandates, administrative structures, and manpower utilization. *Spring.* Asay.
- MHCH 225 Practicum: Leadership in School Health Programs** (1-4). (PHNU 225) Prerequisites, MHCH 224 or equivalent and permission of instructor. An elective, individually planned and supervised school-community based field experience. De-

signed to provide leadership experiences in delivery of school health services. *Spring*. Asay.

- MHCH 254** **Social Work in Public Health (2)**. Permission of instructor required. Analyzes role and functions of social workers in public health with emphasis on multi-disciplinary practice. Focus is on planning social work component of health program. Observational visits to selected sites. *Fall*. Watkins.
- MHCH 255** **Case and Program Consultation in Public Health (2-3)**. (PHNU 255). Examination of the practice of case and program consultation in public health settings. Analysis of consultation as a mutual problem-solving process including evaluation. Roles and relationships of consultant and consultee are considered with provision for an experiential learning opportunity. Emphasis is on multidisciplinary practice. *Spring (3 with practicum), summer (2)*. Watkins.
- MHCH 266** **United States Health Policy (HPAA 266) (2-3)**. Examination of policy issues pertaining to delivery of health services in the United States. Evolution and current developments are examined in an effort to evaluate the administrative implications of current and proposed systems of health delivery in the U.S. *Spring*. Allen, Miller.
- MHCH 300** **Research in Maternal and Child Health (2 or more)**. Open by special arrangement to students desiring to initiate and pursue an original investigation of a selected program. *Four or more hours a week, fall, spring, or summer*. Staff.
- MHCH 307** **Seminar in Disorders of Development and Learning in Childhood (PHYT 307) (2)**. Seminar for students with prior background in child development or related areas on interdisciplinary diagnosis and management of developmental problems in childhood. Focus on staff and student prepared case material. *Two seminar hours a week, spring*. Knobeloch; DDDL staff.
- MHCH 309** **Issues of Advocacy in Maternal and Child Health (3)**. Permission of instructor required. Current efforts to extend entitlements to health services are examined in the context of professional consultation and technical assistance. *Spring*. Howze.
- MHCH 315** **Seminar in Maternal and Child Health (2)**. Non-majors require permission of instructor. This seminar provides an opportunity for students and faculty to explore in greater depth selected subjects within the field of maternal and child health. *Four seminar hours a week, summer*. Staff.
- MHCH 320** **Seminar in Programs to Affect Human Reproduction (2)**. Application of health services research and behavioral, biological, epidemiological, and clinical studies in human reproduction and reproductive outcomes. *Four seminar hours a week, fall*. Udry.
- MHCH 321** **Seminar in Programs to Affect Child Care and Development (2)**. Analysis of programmatic research and behavioral and biological studies in child care and development; its contribution to the design and to the research and evaluation of programs affecting child care and development. *Four seminar hours a week, spring*. Schaefer, Siegel.
- MHCH 322** **Human Sexual Behavior (3)**. Permission of instructor required. Scientific foundation for understanding human sexual behavior. Including biological, psychological and sociological perspectives. Research emphasis. Udry.
- MHCH 393** **Master's Thesis (3-6)**. *Fall and spring*.
- MHCH 394** **Doctoral Dissertation (3 or more)**. *Fall and spring*.
- MHCH 400** **General Registration (0)**.

## Department of Nutrition

- NUTR 50 Introduction to Human Nutrition (3).** Presented as an integrated body of knowledge derived from several disciplines. Functions and sources of man's food. Nutrient requirements and their relation to health and disease. The relevance of nutrition to individual well being, social welfare, and economic development. *Fall.* Anderson.
- NUTR 99 Undergraduate Research (3).** Permission required from faculty research director. Directed readings or laboratory study on a selected topic. Written report is required. May be taken more than once for credit. *Six laboratory hours per week, fall, spring, summer.* Staff.
- NUTR 100 Nutrition and Human Health (3).** Prerequisite, EPID 160. A review of the physiological and environmental determinants of human nutritional requirements and the relation of diet to human health and disease. *Spring.* Edozien.
- NUTR 110 Applied Nutrition for Health Professions (3).** Prerequisites, previous or concurrent courses in chemistry, biochemistry, and physiology/anatomy at undergraduate or graduate level. Knowledge and understanding of nutrition and application to the preventative and therapeutic care of man in a health-team approach. *Spring.* Anderson, staff.
- NUTR 140 Readings in Nutrition (1-6).** Prerequisite, permission of instructor. Reading and tutorial guidance in special areas of nutrition such as international nutrition and nutrition and population. *Fall, spring and summer.* Staff.
- NUTR 150 Cell Biology (4).** Prerequisites, a course each in biochemistry and physiology or permission of instructor. A review of the general structure and function of the cell. Chemistry and metabolism of carbohydrates, proteins, lipids, vitamins and minerals. Endocrine and nervous integration of cellular mechanisms. *Fall.* Anderson, Switzer.
- NUTR 151 Cell Biology Laboratory (3).** Prerequisites, two chemistry laboratory courses and concurrent registration in NUTR 150. A laboratory course designed to acquaint students with the equipment and theory of modern biochemical and biophysical methods used in nutrition research. *Six laboratory hours per week, fall.* Switzer, Anderson.
- NUTR 152 Meal Planning, Food Selection and Preparation (3).** Prerequisite, NUTR 50 or equivalent. Introduction to foods important in the American diet; composition and properties; factors affecting the selection, handling and preparation of foods; menu planning and meal preparation. A laboratory is included. *Three lecture hours per week, fall.* Folds.
- NUTR 153 Food Production, Processing and Packaging (3).** Prerequisite, NUTR 50 or equivalent. Impact of all parts of food industry on availability and nutritive value of foods, and food safety. *Spring.* Forsythe.
- NUTR 154 Human Nutrition (4).** Prerequisites, NUTR 50, BIOC 100, ZOOL 45. A second level course in human nutrition which deals with nutrient requirements in relation to specific cellular needs and mechanisms. Structural and metabolic aspects of carbohydrates, lipids, proteins, vitamins and minerals. *Spring.* Fanelli.
- NUTR 155 Introduction to Public Health Nutrition (3).** Prerequisite, NUTR 50 or equivalent. The functions of the nutritionist in the community, including an assessment of nutritional needs and an examination of existing food and nutrition programs and services and their relationship to other health and social programs. Occasional field trips to agencies. *Fall.* Farthing.
- NUTR 156 Food Service Systems Management (3).** Basic concepts of food service system management applied to small and medium-sized group and health care facilities in the community. *Two lecture and laboratory hours per week, fall, spring.* Staff.

- NUTR 157 Therapeutic Nutrition (3).** Prerequisites ZOO 45, BIOC 100, NUTR 152. Corequisite NUTR 154. A study of the relationship of diet to diseases of man and of dietary intervention in the prevention and/or treatment of these conditions. *Spring*. Burge.
- NUTR 159 Food Habits (3).** Social, cultural, and psychological influences on food consumption patterns of individuals. Includes a study of selected research methodologies and alternate U.S. food consumption patterns. *Spring*. Burge.
- NUTR 160 Economics of Nutrition and Public Health (3).** Prerequisite, two social science courses. Concepts and methodologies used by economists in examining health and nutritional issues at the microeconomic level. Emphasis will be on examining how economics can be used to understand the determinants and consequences of health/nutritional status and a few key aspects of health and nutritional behavior. *Spring*. Popkin.
- NUTR 200 Maternal, Infant and Child Nutrition (3).** Prerequisite, NUTR 154 or permission of instructor. This course covers the nutritional needs of women during the child-bearing years, infants and children; the community, ethnic and socioeconomic influences on food intake of these target populations, and community food and nutrition programs designed to meet their unique nutritional needs. *Two lecture and two seminar hours per week, spring*. Farthing.
- NUTR 201 Nutrition of Adults and the Elderly (3).** Prerequisite, NUTR 154 or equivalent or permission of instructor. A review of the effects of the aging process on human nutrition. Physiological, psychological and sociological factors which affect dietary habits and nutrient intake will be examined. *Spring*. Edozien.
- NUTR 202 Nutritional Pathology (3).** Prerequisite, NUTR 154. A review of the epidemiology, pathology and prevention of disorders related to diet and nutrition. *Spring*. Edozien.
- NUTR 205 Principles of Public Health Nutrition (3).** Prerequisite, NUTR 154 or equivalent. This course is designed to acquaint students with the roles and functions of the nutritionist in community health and to assist them, through classroom work and practical experience in the community, to acquire the basic knowledge and skills required to perform these functions. *Three lecture hours and concurrent field experience per week, fall*. Kaufman.
- NUTR 207 Nutrition Education (3).** NUTR 50 or equivalent and permission of instructor. Principles and practice of nutrition education with emphasis on the community setting for small groups and individuals. Use of modern techniques, including written and audiovisual instruments, geared to modification of dietary behavior and to prevention of disease. *Fall*. Farthing.
- NUTR 208 Nutrition Programs and Services (3).** Prerequisite, NUTR 205. An overview of the planning and management of local, state and federal public health nutrition programs covering their legislation and administrative structures and responsibilities of the nutritionist. *Four seminar hours and concurrent field experience per week, spring*. Kaufman.
- NUTR 212 Nutritional Assessment (3).** Prerequisites, NUTR 154 and laboratory experience in chemistry or nutrition science. This course develops the theory and rationale of nutritional assessment of individuals and communities with various techniques including clinical, anthropometric, dietary and laboratory methods. Emphasis is given to experimental design. *One lecture and four laboratory hours per week, spring*. Edozien. Switzer, Fanelli.
- NUTR 215 International Nutrition (3).** Critical review of the dimensions of world problems in nutrition, with emphasis on the micro and macro determinants of malnutrition, the consequences of malnutrition, and the programs and policies for eliminating malnutrition. *Three lecture hours per week, fall*. Popkin.

- NUTR 240 Problem in Nutrition (1-6).** Prerequisite, permission of instructor. A course for students who wish to make a study of some special problem in nutrition. Lectures, seminars and/or laboratory work according to the special area under study. *Fall, spring, and summer.* Staff.
- NUTR 250 Clinical Nutrition Practice (1-6).** Prerequisite, NUTR 157 or equivalent. Students are assigned to a medical facility where, under supervision of registered dietitians, they participate in nutritional care of patients. Field fee of \$350. *Forty hours per week for twelve weeks, summer.* Burge.
- NUTR 251 Field Experience II (1-3).** Students are assigned to a state, local or district health agency or other appropriate agency for supervised field experience. Field fee required. A brief written report of activities is required. *Fall, spring, and summer.* Staff field preceptors.
- NUTR 300 Nutritional Aspects of Protein, Lipid and Carbohydrate Metabolism (3).** Prerequisites, NUTR 150 and 154; 201 or 202 or 212. Recent advances in the nutritional aspects of protein, lipid, and carbohydrate metabolism will be reviewed. *Six seminar hours per week, fall.* Forsythe.
- NUTR 301 Nutritional Aspects of Mineral Metabolism (3).** Prerequisites, NUTR 150; 201 or 202 or 212. Recent advances in the nutritional aspects of mineral metabolism will be reviewed. *Six seminar hours per week, spring.* Staff.
- NUTR 302 Nutritional Biochemistry (3).** Prerequisites, NUTR 151 and 212. Research procedures in nutritional biochemistry and physiology, including the identification and measurement of nutrients and their metabolites in foods and in human and animal tissues and body fluids. *Three laboratory hours per week, fall.* Forsythe.
- NUTR 303 Advanced Seminar in Public Health Nutrition (3).** Prerequisites, NUTR 205; NUTR 208 or 215. The broad aspects of public health issues, such as U.S. and international nutrition problems and issues, intervention options, and policy decisions—basis and rationale—will be discussed. *Six seminar hours per week, spring.* Staff.
- NUTR 304 Advanced Seminar in Nutrition Behavior (3).** Prerequisites, NUTR 159 and 207 or permission of instructor. Analysis of the ways anthropology, economics and psychology have been used and can be used to affect nutrition change. *Six seminar hours per week, fall.* Staff.
- NUTR 340 Seminar in Nutrition (1-6).** Prerequisites, a minimum of one year of graduate work in nutrition and permission of instructor. Seminars and/or laboratory work, according to the special area under study. *Fall, spring and summer.* Staff.
- NUTR 355 Advanced Community Nutrition Practice (3).** Prerequisites, NUTR 205 and 208 or permission of instructor. Development of skills, techniques and competencies, through practical experience, in the assessment of the nutritional needs of a community, or in the planning and delivery of community nutrition services in a health or other appropriate agency or the evaluation of an ongoing nutrition program. *Six laboratory hours per week, fall, spring and summer.* Staff.
- NUTR 389 Preparation of Research Prospectus (1).** Theoretical and practical aspects of selecting a research topic with subsequent preparation of the research prospectus. *Two seminar hours.* Fall. Forsythe.
- NUTR 390 Nutrition Research (1-9).** Individual arrangements may be made by the student to spend part or all of his time in supervised investigation of selected problems in nutrition. *Fall, spring and summer.* Staff.
- NUTR 391 Nutrition Research Seminar (1).** Students registered for NUTR 390 shall present at least one formal seminar each term on some aspect of their research project (community or laboratory). *Fall, spring and summer.* Staff.

- NUTR 392 **Master's Report** (1-6). *Fall, spring and summer.* Staff.
- NUTR 393 **Master's Thesis** (0-6). *Fall, spring and summer.* Staff.
- NUTR 394 **Doctoral Dissertation** (0-9). *Fall, spring and summer.* Staff.
- NUTR 400 **General Registration** (0).

## Department of Parasitology and Laboratory Practice

- PALP 131 **Parasitism and Human Disease** (2). A course consisting of lectures, demonstrations, and laboratory work given as an introduction to the principles of infectious diseases. *One lecture and two laboratory hours a week, fall.* Goulson, Okey.
- PALP 134 **Human Parasitology** (4). Prerequisite, permission of the instructor. Lectures, demonstrations, and laboratory work on the most common animal parasites of man with special emphasis on their life cycles, host responses, and laboratory diagnosis. *Two lecture and four laboratory hours a week, fall.* Weatherly.
- PALP 140, 141 **Problems in Parasitology** (1 or more). A course for students who wish to make an intensive study of some special problem in human parasitology. *Two or more hours a week, fall and spring.* Staff.
- PALP 142, 143 **Problems in Public Health Laboratory Practice** (1 or more). A course for students who wish to make an intensive study of some special problem in the laboratory field. *Two or more hours a week, fall and spring.* Staff.
- PALP 150 **Public Health Bacteriology** (4). Prerequisite, permission of the instructor. Lectures and laboratory studies of the human pathogenic bacteria and fungi with particular emphasis on those submitted to public health laboratories for complete identification. *One lecture and four laboratory hours a week, fall.* Read.
- PALP 151 **Public Health Virology** (3). Prerequisites, PALP 150 and permission of the instructor. Lectures and laboratory studies on isolation and identification techniques. *Two lecture and two laboratory hours a week, spring.* Read.
- PALP 192 **Medical Mycology** (4). Prerequisite, permission of instructor. Isolation, identification, epidemiology, mycoserology, and clinical importance of medically significant fungi. Identification of hyphomycetes and yeasts will be stressed. *Two lecture and four laboratory hours a week, fall.* McGinnis.
- PALP 230 **The Nature of Parasitism** (3). Prerequisite, permission of instructor. A course consisting of lectures and discussions on the immunobiology of parasitic protozoa and helminths. Host and parasite factors thought to be important in pathogenesis are presented. Medically important protozoa and helminths are stressed. *Three lecture hours a week, spring.* Seed.
- PALP 232 **Parasitological Methods** (4). Prerequisite, PALP 134. An introduction to research methods employed in the laboratory studies of various protozoan and helminth parasites. *Two lecture and four laboratory hours a week, spring.* Goulson.
- PALP 233 **Malariaology** (3). Prerequisite, permission of instructor. Lectures, demonstrations, and laboratory devoted to the study of malaria in man and mosquito. The biology and classification of mosquitos are also considered. *Two lecture and two laboratory hours a week, fall.* Hendricks.
- PALP 234 **Medical Entomology** (3). Prerequisites, ZOOL 11 and PALP 134, or equivalents. Lectures, demonstrations, and laboratory studies on the insects, ticks, mites, and other arthropods that transmit and/or cause diseases of man. Methods of identifying these forms are emphasized in the laboratory. *Two lecture and two laboratory hours a week, spring.* Hendricks.

- PALP 235 **Problems in Public Health Laboratory Methodology** (1 or more). Prerequisites, PALP 142 or 143, and permission of the instructor. *Two or more hours a week, fall and spring.* Goulson.
- PALP 250 **Public Health Laboratory Methods I** (2). Prerequisite, permission of the instructor. Lectures and seminars pertaining to current diagnostic techniques in Public Health Bacteriology and Mycology. *One lecture and two seminar hours a week, fall.* Okey.
- PALP 251 **Public Health Laboratory Methods II** (5). Prerequisite, permission of the instructor. Lectures and demonstrations, and laboratory work on the most important microbiological diagnostic procedures, e.g., immunoserology, used in the modern public health laboratory. *Two lecture and six laboratory hours a week, spring.* Okey.
- PALP 260 **Public Health Laboratory Management I** (3). Prerequisite, permission of instructor. A study of the broad responsibilities and activities of the public health laboratory, its relations to other divisions of the Health Department, and its role in comprehensive health planning. *One lecture and two seminar hours a week, fall.* Okey.
- PALP 261 **Public Health Laboratory Management II** (3). Prerequisite, permission of the instructor. A continuing study in depth of the responsibilities and activities of the public health laboratory. *Two lecture and two seminar hours per week, spring.* Okey.
- PALP 270 **Biohazard Science I** (3). Prerequisite, permission of the instructor. Philosophy of safety, laboratory-acquired and nosocomial infections, other biohazards, fundamentals of laboratory safety, and principles of disinfections and sterilization. *Fall.* Tulis.
- PALP 271 **Biohazard Science II** (3). Prerequisite, PALP 270. Lectures and demonstrations on biohazard containment systems, aerosol and surface sampling, filtration technology, hazards of animal experimentation, carcinogen research, oncogenic virus studies, recombinant DNA, and aspects of biohazard control. *Spring.* Tulis.
- PALP 275 **Laboratory Methods in Biohazard Science** (3). Prerequisites, PALP 270 and 271. Fundamentals of disinfection and sterilization processes including official methodology, packaging, dosimetry, inactivation kinetics, process control, sterility testing, and use of containment facilities and aerosol and surface sampling equipment. *Three lecture and ten laboratory hours per week, summer.* Tulis.
- PALP 276 **Advanced Studies in Biohazard Science** (3). Prerequisites, PALP 270, 271, and permission of instructor. Lectures and seminars concerned with biohazard risk assessment, medical surveillance, impact of state and federal regulations, environmental issues, principles of quality assurance, laboratory design, and safety management. *Two lecture and two seminar hours per week, fall.* Tulis.
- PALP 277 **Special Topics in Biohazard Science** (2). Prerequisites, PALP 270, 271, and permission of instructor. Current problems and trends in biohazard science, impact of emerging legislation, development of standards, and other topics. *One lecture and two seminar hours per week, spring.* Tulis.
- PALP 331 **Seminar in Parasitology** (1). Prerequisite, permission of staff. Discussion of selected topics in parasitology. *One seminar hour a week, spring.* Staff.
- PALP 333 **Seminar in Public Health Laboratory Practice** (1). Prerequisite, permission of staff. Discussion of selected topics in the public health laboratory field. *One seminar hour a week, spring.* Staff.
- PALP 334 **Research in Parasitology** (2 or more). Open to advanced students only. *Four or more laboratory hours a week, to be arranged, fall and spring.* Goulson, Hall, Hendricks, Seed, Weatherly.

- PALP 336 **Research in Public Health Laboratory Methodology** (2 or more). Open to advanced students only. *Four or more laboratory hours a week, to be arranged, fall and spring.* Weatherly, Read, Goulson, Okey, Tulis.
- PALP 394 **Doctoral Dissertation** (3-9). *Fall and spring.* Staff.
- PALP 400 **General Registration** (0).

## Public Health

- PUBH 101 **Problem Oriented Approaches to Public Health** (3). This course, provides an opportunity for interested students to integrate approaches of the several public health disciplines to selected public health problems, Byssinosis and Malnutrition. Each topic will be discussed serially by a range of specialists to review causation, personal and social effects, analytic methods, potential methods of control, and policy issues. *Spring.* Phillips, Reist, Anderson, Kaufman.

## Department of Public Health Nursing

- PHNU 101 **Aging and Human Development** (HADM/HEED/NUTR) (3). Biological, medical, demographic and social aspects of aging. New methods and concepts of aging processes and their implications. Talbot.
- PHNU 140, 141, 142 **Readings in Public Health Nursing** (1-3). Prerequisites to be arranged with the faculty. Reading and tutorial guidance in a selected area of public health nursing or occupational health nursing. *Two or more hours per week, fall, spring, and summer.* Staff.
- PHNU 160 **Delivery of Community Nursing Services** (3). Permission of instructor required. Analysis of patterns of organization of community nursing services and relationships to the health care delivery system. Special emphasis on basic management skills and their application. Tigar.
- PHNU 171 **Educational Roles of Community Health Professionals** (3). Application of teaching-learning concepts, principles of adult education, and individual and group teaching strategies in schools, worksites and other settings. Includes designing implementing, evaluating continuing education. *Fall and spring.* Asay, Ossler.
- PHNU 182 **Health Care Services in Occupational Settings** (3). Introduction to population-based health care for workers. Includes major causes of work-related morbidity and mortality, strategies for the team approach and components of occupational health programs. *Three lecture hours per week and a plant walk through, spring.* Ossler.
- PHNU 193 **Innovation and Change in Public Health Nursing Practice I** (3). Permission of instructor required. Analysis of factors and approaches considered in innovation and change in public health nursing. This includes development of the theoretical base of public health nursing practice. *Two lecture and two seminar hours per week.* Staff.
- PHNU 196 **Advanced Practice in Public Health Nursing** (3). Permission of instructor required. Prerequisite: licensure as registered nurse in North Carolina. Concepts of health promotion/illness prevention applied to families/groups/community. Methods of assessment and intervention. Selected practice experiences. Analysis of case materials. *One lecture, two seminar and two laboratory hours per week.* Staff.

- PHNU 201 **Special Studies** (1-3). Permission of Department chairman required. Sections will focus on specific topics of current interest to health workers. Flyers describing the section offering will be distributed prior to registration each semester. *Lecture hours per week dependent upon credit, fall and spring.* Staff.
- PHNU 212 **Seminar on the Family** (MHCH 212) (1). Permission of instructor. Family theory, research and assessment; family relationships and environments that influence adult and child health and development; professions and institutions that influence family functioning. *Two seminar hours per week, spring.* Schaefer.
- PHNU 215 **Child Health Assessment and Care** (MHCH 215) (2). Permission of instructor. Seminar series which emphasizes theoretical, conceptual and practice bases fundamental to assessment of infants and young children in community settings. Focus is upon wellness care and management of common and long-time childhood conditions. *Four seminar hours per week, spring.* Adams.
- PHNU 217 **Child Health: Nursing Intervention** (MHCH 217) (1-6). Permission of instructor. For nurses with appropriate theoretical and experiential backgrounds in child health and development. Emphasis is on nursing practice with infants, young children and their families in a variety of community settings throughout North Carolina. *Four to twenty-four supervised clinical hours per week, spring, summer, fall.* Adams.
- PHNU 220 **Antepartal Theory: Assessment and Care of Pregnant Women** (MHCH 220) (2). Theoretical basis of antepartal care emphasizing the concept of risk and assessment of maternal and fetal well-being. *Spring.* Staff.
- PHNU 221 **Antepartal Assessment and Care: Clinical Practice** (MHCH 221) (3). Permission of instructor and MHCH-PHNU 220 must be taken concurrently. Initial and ongoing assessment of pregnant women including physical and pelvic examinations. Designed for nurses. *Six laboratory hours per week, spring.* Staff.
- PHNU 222 **Family Planning Theory: Assessment and Care of Women in the Reproductive Years** (MHCH 222) (1). For health professionals doing family planning counseling. Includes modes of action effectiveness, contraindications, side effects, complications, advantages, disadvantages of temporary and permanent methods of birth control. *Spring.* Staff.
- PHNU 223 **Family Planning Assessment and Care: Clinical Practice** (MHCH 223) (2-3). Permission of instructor and MHCH-PHNU 222 must be taken concurrently. Initial and ongoing assessment of women requesting or utilizing temporary birth control methods. For nurses. Students competent in performing physical and pelvic exams, 2 credits; all others 3 credits. *Four or six laboratory hours per week, spring.* Staff.
- PHNU 224 **School Age Population: Health Problems and Programs** (MHCH 224) (3). Permission of instructor. Health needs and problems of school aged population. Development and evaluation of programs to meet those needs, including examination of legislative mandates, administrative structures and manpower utilization. *Spring.* Asay.
- PHNU 225 **Practicum: Leadership in School Health Programs** (MHCH 225) (1-4). MHCH-PHNU 224 or equivalent and permission of instructor. An elective, individually planned and supervised school-community based field experience. Designed to provide leadership experiences in delivery of school health services. *Three to twelve laboratory hours per week, spring.* Asay.
- PHNU 240, 241, 242 **Problems in Public Health Nursing** (1-4). A course for students in public health nursing. Students will make an intensive study of some special problem in public health relevant to public health nursing. The study will result in a paper which will demonstrate the application of research principles. *Hours to be arranged. Fall, spring, and summer.* Staff.

- PHNU 255 Case and Program Consultation in Public Health (MHCH 225) (2-3).** Examination of the practice of case and program consultation in public health settings. Analysis of consultation as a mutual problem-solving process including evaluation. Roles and relationships of consultant and consultee are considered with provision for experiential learning opportunities. Emphasis is on multidisciplinary practice. *Spring (3 with practicum); summer (2).* Watkins.
- PHNU 261 Community Nursing Service Administration I (3).** Permission of instructor. Concepts and methods of administering community nursing services. Functions of the nurse administrator in areas of organizing, staffing, program planning, priority setting and evaluation of services. Tigar.
- PHNU 262 Community Nursing Service Administration II (3).** Permission of instructor. Continuation of PHNU 261. Aspects of fiscal management, personnel management, legal considerations, records and reporting relating to delivery of community nursing services. Leadership styles, motivation and application of administrative processes. *Two lecture and two seminar hours per week.* Tigar.
- PHNU 271 Instructional Approaches in Public Health Nursing (3).** Permission of instructor. Educational issues involved in preparation for public health nursing practice and education. Study and evaluation of public health-community nursing content in nursing curricula. Strategies of instructional approaches involving innovation and change. *Three lecture hours per week, fall and spring.* Ossler.
- PHNU 272 Practicum in Teaching Community Health Nursing (3-6).** Permission of instructor. Supervised experience involved in teaching community health nursing to students at the undergraduate level. Problems related to curriculum, organization, and faculty roles will be explored under faculty direction. Field fee: \$300.00. *One seminar hour biweekly and eighteen laboratory hours weekly, fall and spring.* Asay.
- PHNU 280 Occupational Health Nursing I (3).** Permission of instructor required. Concerns factors influencing the development and operation of occupational health nursing programs. General and special health services contingent on work environment and inherent health problems in the employed populations are considered. *Fall.* Ossler.
- PHNU 281 Occupational Health Nursing II (3).** Prerequisites, PHNU 280. Continuation of PHNU 280. Role components of occupational health nursing with emphasis on designing, implementing, evaluating occupational health programs. Application of principles of toxicology, epidemiology and occupational health nursing. *Two seminar and four laboratory hours per week, spring.* Ossler.
- PHNU 293 Innovation and Change in Public Health Nursing Practice II (3-6).** Permission of instructor required. Integration of selected factors of innovation and change into the practice of public health nursing. Practice credit variable. *Two lecture, two seminar, and zero to nine laboratory hours per week. Fall, spring, summer.* Staff.
- PHNU 297 Supervision in Public Health Nursing (3).** Permission of instructor required. For public health nursing and other selected students. Philosophy, principles and methods of supervision with emphasis on the supervisor's role in staff development and first-level management. *One lecture and four seminar hours per week, fall, spring.* Staff.
- PHNU 299 Research Methods in Public Health Nursing (2-4).** Permission of instructor required. Prerequisite: BIOS 101. Analysis of nursing research emphasizing methodology and implications for community health nursing practice. For over two credits, students develop a research design or participate in the research process. *Two lecture and two seminar hours for ten weeks for two credits. Additional proposal development seminars for four credits.* Highriter, Adams.

- PHNU 300 **Seminar in Public Health Nursing (3)**. Non-majors require permission of instructor. Analysis of current factors influencing public health nursing practice. Emphasis is on issues in health planning and policy, quality assurance and standards of professional practice. *Two lecture and two seminar hours per week, fall and spring.* Staff.
- PHNU 301 **Field Observation of National Community Health Nursing Service (1)**. Permission of instructor. Orientation to national agencies in Washington, D.C. area concerned with community health nursing practice. Supervised visits made to agencies, e.g. The Division of Nursing, HHS, and Walter Reed Army Institute. Field fee \$150.00. *Three full consecutive days of field observations and seminars, spring.* Henry, Wilcox.
- PHNU 340, 341, 342 **Research in Public Health Nursing (1-4)**. PHNU 299 or the equivalent and permission of instructor. Independent research in public health nursing under supervision. *Two to eight laboratory hours per week, fall, spring, summer.* Staff.
- PHNU 392 **Major Paper (1-6)**. Permission of instructor required. A major paper on a problem relevant to public health nursing. This study may extend over more than one semester. Credit is assigned accordingly. *Fall, spring and summer.* Staff.
- PHNU 393 **Master's Thesis (3-9)**. *Fall, spring, and summer.* Staff.
- PHNU 396 **Field Practice In Community Health Nursing (3-9)**. Permission of instructor. Field experience in community health nursing or occupational health nursing practice. Study and observation of selected areas related to student's program of study. Field fee \$450.00. *Three laboratory hours per week, for each credit, fall, spring, and summer.* Staff.
- PHNU 400 **General Registration (0)**.





