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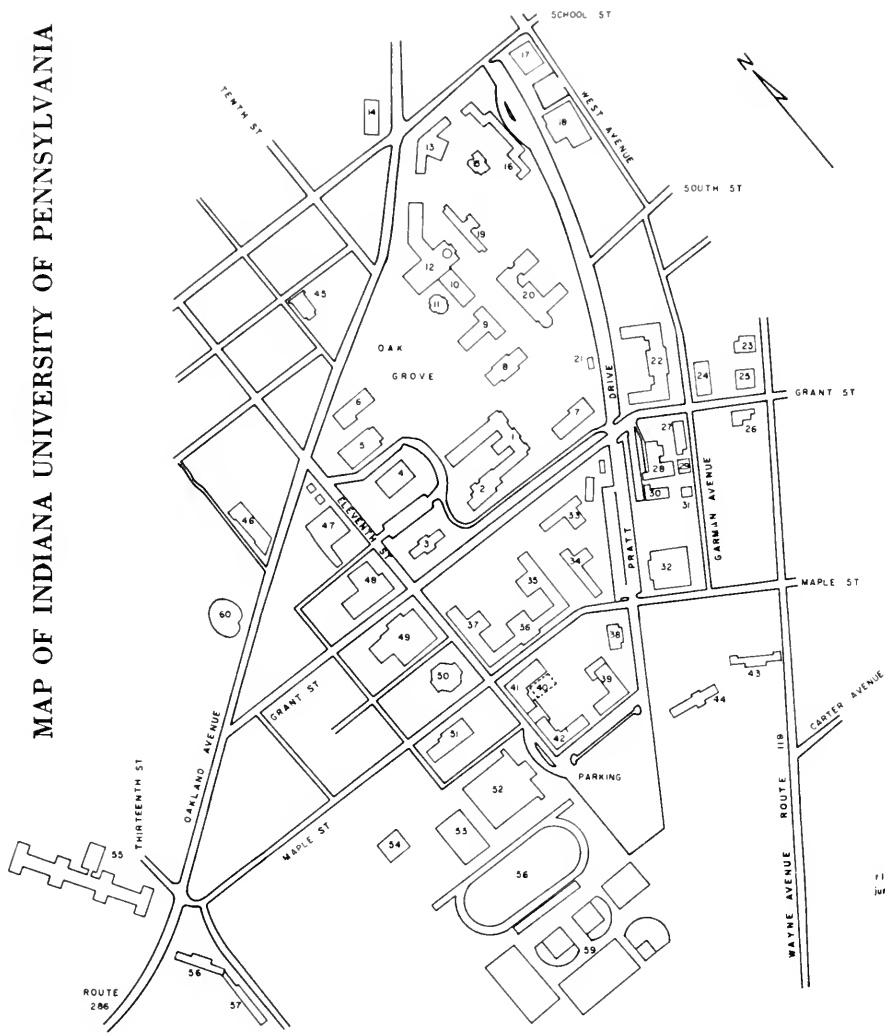
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MAP OF INDIANA UNIVERSITY OF PENNSYLVANIA



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june, 68

KEY TO BUILDINGS

1. John Sulton Hall
2. Thomas Sulton Hall
3. Clark Hall
4. Stabley Library
5. Fisher Auditorium
6. Waller Hall
7. Ackerman Hall
8. McElhoney Hall
9. Leonard Hall
10. Walsh Hall
11. Wilson Hall
12. Weyandt Hall
13. Elkin Hall
14. Leisinger Hall
15. Elkin House
16. Whitmyer Hall
17. Student Affairs Building
18. Student Union
19. Gordon Hall
20. Keith Hall Theater
21. Flagstone Theater
22. Women's Dorm (proposed)
23. Algonquin Hall
24. Conestoga Hall
25. Stone Manor
26. Grant Hall
27. Maintenance Building
28. Boiler Plant
29. Martin Range
30. Shop Building
31. Maintenance Garage
32. Dining Hall (proposed)
33. Wahr Hall
34. Lougham Hall
35. Turnbull Hall
36. Stewart Hall
37. Mack Hall
38. Health Services Building
39. Men's Dormitory
40. Area Emer. Op. Center
41. Men's Dormitory
42. Men's Dormitory
43. Leray Hall
44. McGregor Hall
45. Uhler Hall
46. Wyoming Hall
47. Cagswell Hall
48. Classroom Hall (proposed)
49. Foster Dining Hall
50. Learning Research Center
51. Military Hall
52. Memorial Field House
53. Tennis Courts
54. Lecture Building
55. Carriage House
56. Oakland Hall
57. Rooney Hall
58. Miller Stadium
59. Athletic Fields
60. Newman Center

The Graduate School

BULLETIN

VOLUME 77

SEPTEMBER, 1971

NUMBER 6

INDIANA UNIVERSITY OF PENNSYLVANIA
INDIANA, PENNSYLVANIA

Graduate Catalog

1972-1973



THIS UNIVERSITY IS ACCREDITED BY THE NATIONAL COUNCIL FOR ACCREDITATION OF TEACHER EDUCATION FOR THE PREPARATION OF ELEMENTARY AND SECONDARY TEACHERS AND TEACHERS IN THE SPECIAL FIELDS OF ART, BUSINESS, HOME ECONOMICS, MUSIC, DRIVER AND SAFETY EDUCATION, DENTAL HYGIENISTS, AND PUBLIC SCHOOL NURSES, AND BY THE MIDDLE STATES ASSOCIATION OF COLLEGES AND SECONDARY SCHOOLS. THE UNIVERSITY IS A MEMBER OF THE COUNCIL OF GRADUATE SCHOOLS IN THE UNITED STATES.

Issued Annually by the Trustees of the
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C A L E N D A R

Fall Semester, 1971-1972

- August 2—Students who plan to take graduate work during the fall semester must have an application for graduate study approved on or before this date.
- August 16—Tentative class programs for fall semester must be submitted by this date.
- September 2—Payment of fees for all graduate students in fall semester must be completed by this date.
- September 11—Fall semester classes begin.
- October 5—Prospective January graduates must have filed an application for graduation on or before this date.
- November 22—Thanksgiving vacation begins.
- November 29—Thanksgiving vacation ends.
- December 1—Final draft of research project or thesis due for January graduates.
- December 17—Christmas vacation begins.
- January 3—Christmas vacation ends.
- January 21—Semester ends.

Spring Semester, 1972

- December 1—Students who plan to take graduate work during the spring semester must have an application for graduate study approved on or before this date.
- December 15—Tentative class programs for spring semester must be submitted by this date.
- January 20—Payment of fees for all graduate students in spring semester must be completed by this date.
- January 25—Spring semester evening classes begin.
- January 29—Spring semester Saturday classes begin.
- March 2—Prospective May graduates must have filed an application for graduation on or before this date.
- April 1—Final draft of research project or thesis due for May graduates.
- March 28—Easter vacation begins (at close of classes).
- April 6—Easter vacation ends (8:00 a.m.).
- May 13—Classes terminate.
- May 27—Semester ends.
- May 28—Commencement.

Pre-Session, 1972

- May 1—Students who plan to take graduate work during pre-session must have an application for graduate study approved on or before this date.
- May 15—Tentative class programs for pre-session must be submitted by this date.
- June 2—Prospective August graduates must have an application for graduation approved on or before this date.
- June 3—Payment of fees for all graduate students in pre-session must be completed on or before this date.
- June 8—Pre-session classes begin.
- June 21—Pre-session classes terminate.

Main Session, 1972

- June 2—Students who plan to take graduate work during main session must have an application for graduate study approved on or before this date.
- June 16—Tentative class programs for main session must be submitted by this date.
- June 20—Payment of fees for all graduate students in main session must be completed on or before this date.
- June 27—Main session classes begin.
- June 30—Final draft of research project or thesis due for August graduates.
- August 4—Main session classes terminate.

Post-Session, 1972

- July 15—Students who plan to take graduate work during post-session must have an application for graduate study approved on or before this date.
- July 21—Tentative class programs for post-session must be submitted by this date.
- August 3—Payment of fees for all graduate students in post-session must be completed by this date.
- August 7—Post-session classes begin.
- August 18—Post-session classes terminate.
- August 20—Summer Commencement.

Fall Semester, 1972-1973

- August 1—Students who plan to take graduate work during the fall semester must have an application for graduate study approved on or before this date.
- August 15—Tentative class programs for fall semester must be submitted by this date.
- September 2—Payment of fees for all graduate students in fall semester must be completed by this date.
- September 5—Fall semester evening classes begin.
- September 9—Fall semester Saturday classes begin.
- October 1—Prospective January graduates must have filed an application for graduation on or before this date.
- November 21—Thanksgiving vacation begins (at close of classes).
- November 28—Thanksgiving vacation ends (8:00 a.m.).
- December 1—Final draft of research project or thesis due for January graduates.
- December 16—Christmas vacation begins.
- January 2—Christmas vacation ends.
- January 13—Semester ends.

Spring Semester, 1973

- December 1—Students who plan to take graduate work during the spring semester must have an application for graduate study approved on or before this date.
- December 15—Tentative class programs for spring semester must be submitted by this date.
- January 20—Payment of fees for all graduate students in spring semester must be completed by this date.
- January 23—Spring semester evening classes begin.
- January 27—Spring semester Saturday classes begin.
- March 2—Prospective May graduates must have filed an application for graduation on or before this date.
- March 28—Easter vacation begins (at close of classes).
- April 2—Final draft of research project or thesis due for May graduates.
- April 4—Easter vacation ends.
- May 12—Classes terminate.
- May 26—Semester ends.
- May 27—Commencement.

TENTATIVE SCHEDULE OF CLASSES FOR SPRING SEMESTER, 1972

TUESDAY EVENINGS

(5:30-7:10 P.M.)

Art	511	Curriculum Development, Supervision, and Administration in Art
Bio	611	Seminar I
Chem	610	Inorganic Chemistry
CnEd	541	Supervised Experience in Counseling (Elem. 5:30-9:10) (4 cr.)
CnEd	550	Supervision of Guidance Workers (Elem. 5:30-9:10) (4 cr.)
Ed	513	Social Foundations of Education
EdPsy	501	Seminar in Special Topics in Educational Psychology
Eng	575	Major Writers: Henry James (5:20-7:00)
Eng	590	Major Writers: Mark Twain (5:20-7:00)
Hist	501	Historiography
Hist	534	Recent United States History
HE	572	Evaluation in Home Economics
LRes	541	Photographic Fundamentals for Educational Materials
Math	502	Digital Computers and Compiler Systems
Math	521	Basic Concepts in Mathematics
Math	584	Mathematical Statistics I
Phys	503	Theoretical Physics II
Phys	642	Advanced Mechanics II
Psy	502	Research Methods in Psychology II (Psy majors only)
Psy	530	Psychology of Growth and Development
SpE	560	Selected Problems and Research
SpH	518	Voice (5:00)
SpH	561	Advanced Clinical Practicum I (to be arranged)
SpH	563	Advanced Clinical Practicum II (to be arranged)

TUESDAY EVENINGS

(7:30-9:10 P.M.)

Art	522	Art in America
Bio	530	Instrumentation
CnEd	531	Interview and Consultative Techniques
Ed	512	Philosophical Foundations of Education
EdPsy	532	Studies in Pupil Adjustment
ElSc	541	Chemistry II
Eng	521	Modern European Fiction (7:10-9:40) (3 cr.)
Eng	522	Chaucer (7:10-9:40) (3 cr.)
Eng	670	Seminar in American Literature to 1870 (7:10-9:30) (3 cr.)
Geog	528	South America (Seminar)
Geol	504	Earth History
Hist	531	Economic and Social History of Pennsylvania
Hist	591	Social and Intellectual History of the U. S. to 1875
LRes	548	Writing for Radio and Television
Math	507	Numerical Analysis
Math	552	Number Theory
Phil	581	Problems of Logic
Phys	521	Advanced Laboratory Practices I
PolS	573	Regional Political Studies
SpH	516	Stuttering (7:00 p.m.)

WEDNESDAY EVENINGS

(5:30-7:10 P.M.)

Anth	594	Anthropology Seminar
Art	523	Seminar in Art Education
Bio	612	Seminar II
Bus	534	Consumer Economic Problems
CnEd	534	Evaluative Methods in Guidance I
CnEd	543	Planning Principles
CnEd	545	Human Relations and Communications
CnEd	546	Encounter and Sensitivity in Counseling
Ed	513	Social Foundations of Education
EdPsy	550	Clinical Practicum (permit to register required) (by appointment)
EdPsy	561	Seminar in Inter-disciplinary Coordination and Communication (permit to enter required)
EdPsy	572	Advanced Psychology of Childhood Education
El Math	507	Coordinate Geometry and Trigonometry I
ElSc	570	Geology
Eng	582	Major Writers: Wordsworth and Coleridge (5:20-7:00)
Geol	508	Glacial Geology
HE	578	Research Methods in Home Economics Education
Hist	521	History Seminar
Math	564	Linear Algebra II
Math	574	Topology II
Mus	535	Psychology of Music Education
Phys	662	Quantum Mechanics II
Psy	530	Psychology of Growth and Development
Psy	536	Psychology of Learning

WEDNESDAY EVENINGS

(7:30-9:10 P.M.)

Art	527	Renaissance Art
Astro	536	The Sidereal Universe
Bio	562	Animal Physiology
Bus	510	Business Communications and Report Writing
Chem	547	Biochemistry II
CnEd	539	Group Procedures in Guidance
CnEd	542	School Services
CnEd	544	Organizing Principles (1 cr. - 3 wks.)
CnEd	551	Evaluation of Guidance Services (1 cr. - 3 wks.)
EdPsy	502	Advanced Educational Psychology
EdPsy	550	Clinical Practicum (permit to enter required) (by appointment)
EdPsy	560	Human Relations and Communications in Education (permit to enter required)
EdPsy	565	Seminar in Problems of School Psychologists (permit to enter required)
Eng	514	The English Language Since 1500 (7:10-9:40) (3 cr.)
Eng	537	Modern American Fiction (7:10-9:40) (3 cr.)
Eng	610	Seminar in British Literature—Renaissance (7:10-9:40) (3 cr.)
Geog	512	Settlement Geography
Math	536	Functions of a Real Variable II
Math	600	Methods of Research in Mathematics
Mus	532	Seminar in Music Education
Phil	583	American Philosophic Thought
Phys	505	Theoretical Physics IV
SS	514	Research Methodologies in Social Sciences

THURSDAY EVENINGS

(5:30-7:10 P.M.)

Art	553	Graduate Studio in Crafts I
Art	554	Graduate Studio in Crafts II
Art	555	Graduate Studio in Crafts III
Bio	562	Animal Physiology
Bus	541	Principles of Management
Chem	640	Physical Chemistry
CnEd	535	Case Study Techniques
CnEd	541	Supervised Experience in Counseling (Sec. 5:30-9:10) (4 cr.)
CnEd	550	Supervision of Guidance Workers (Sec. 5:30-9:10) (4 cr.)
Ed	511	Historical Foundations of Education
EdPsy	550	Clinical Practicum (permit to enter required) (by appointment)
EdPsy	573	Advanced Psychology of Adolescent Education
El	501	Diagnosis and Remediation of Reading Disabilities
Eng	576	Major Writers: Joseph Conrad (5:20-7:00)
Hist	512	Readings in History
LRes	560	Management of Learning Resources Programs
Math	562	Abstract Algebra II
Math	576	Projective Geometry II
Mus	515	Canon, Double Counterpoint and Fugue
Phys	511	Secondary School Physics Laboratory Practices
Phys	651	Advanced Electromagnetic Theory I
Psy	541	Assessment of Intelligence

THURSDAY EVENINGS

(7:30-9:10 P.M.)

Bio	540	Protozoology
Bus	513	Foundations of Teaching Business Skills
Ed	512	Philosophical Foundations of Education
EdPsy	532	Studies in Pupil Adjustment
El	508	Reading in the Content Areas
El	545	Experiment Studies in Art Education
Eng	529	Milton (7:10-9:40) (3 cr.)
Eng	544	The Psychology of Language (7:10-9:40) (3 cr.)
Geog	541	Agricultural Geography (Seminar)
Hist	546	History of Europe, 1815-1914
LRes	530	Classification and Cataloging of Learning Resources
Math	563	Abstract Algebra I
Math	565	Theory of Groups
PolS	574	Political Science Seminar
Psy	542	Assessment of Personality

SATURDAY MORNINGS

(9:00-10:40 A.M.)

Art	540	Graduate Studio in Ceramics I
Art	541	Graduate Studio in Ceramics II
Art	542	Graduate Studio in Ceramics III
Bio	558	Endocrinology
Bus	523	Marketing Research
CnEd	531	Philosophy and Principles of Guidance
CnEd	536	The Information Service in Guidance
ElSc	541	Chemistry II
Eng	510	Bibliographical Methods in English

Eng	520	Old English Literature (3 cr.) (9:00-11:30)
Eng	527	Restoration and 18th Century Literature (3 cr.) (9:00-11:30)
Geog	550	Reading (Quantification)
Grad	515	Elements of Research (Counselor Education Majors)
Grad	516	Statistical Methods I
Hist	522	History Seminar
HE	522	Seminar in Human Development
HE	577	Independent Study in Home Economics Education
Math	540	Infinite Series II
Psy	533	Psychology of Personality
Soc	565	Adolescent in American Society
Span	510	History of the Spanish Language
SpE	522	Orientation to Rehabilitation
SpH	540	Advanced Audiology

SATURDAY MORNINGS

(11:00 A.M.-12:40 P.M.)

Art	544	Graduate Studio in Fabrics I
Art	545	Graduate Studio in Fabrics II
Art	546	Graduate Studio in Fabrics III
Bio	582	Pathogenic Bacteria
CnEd	538	Management of the Guidance Services
Ed	513	Social Foundations of Education
ElMath	514	Calculus II
Eng	577	Major Writers: Emerson
HE	541	Advanced Foods and Gourmet Cookery
Hist	542	Contemporary Latin American Problems
Math	532	Advanced Calculus II
Span	511	Stylistic Studies

DAYTIME CLASSES

Chem	500	Special Studies	To be arranged
Chem	600	Seminar	F. 4:00
Chem	623	Physical and Chemical Methods of Separation	T. Th. 11:00, F. 8:00-12:00
Econ	525	Monetary Economics	M. W. F. 12:00- 1:00
Econ	553	Contemporary Economic Issues	T. Th. 1:30- 2:45
Econ	554	Seminar, Special Studies in Economics	T. Th. 12:00- 1:15
Econ	555	Industrial and Labor Relations	M. W. F. 3:00- 4:00
Econ	556	History of Economic Thought	T. Th. 9:30-10:45
El	550	The Community and the Elementary School	T. 1:00- 3:00
Eng	551	Twentieth Century British Novel (3 cr.)	S. 12:00- 2:30
Eng	640	Seminar in British Literature—Nineteenth Century (to 1870)	S. 12:00- 2:30
Eng	650	Dissertation (varied credits)	By appointment
Eng	696	Seminar in the Teaching of College English	M. 3:00- 5:30
Geog	517	General City and Regional Planning	M. W. F. 12:00
Geog	519	Urban Planning Basic Studies and Analysis	M. W. 3:00- 5:00
Geog	590	Map and Photo Interpretation	M. W. F. 2:00
Geog	591	Geography Thought and Philosophy	T. Th. 5:00- 6:15
Geog	593	Research II (Individual)	To be arranged
Grad	550	Research and Thesis	To be arranged
Hist	553	History of England Since 1688 (3 cr.)	M. W. F. 10:00
Hist	555	History of Soviet Russia (3 cr.)	M. W. F. 11:00
Mus	503	Music Literature of the Baroque Period	T. Th. S. 9:00

Mus	510	Seminar in Music Literature	M. W. F.	1:00
Mus	516	Analytical Techniques	T. Th. S.	10:00
Phys	521	Advanced Laboratory Practices I	T. Th.	9:00-12:00
Phys	533	Heat and Thermodynamics	M. W. F.	11:00
Phys	541	Analytical Mechanics I	M. W.	1:00
Phys	551	Electricity and Magnetism I	M. W. F.	10:00
Phys	565	Introduction to Nuclear Physics	M. W. F.	2:00
PolS	560	Latin America (3 cr.)	M. W. F.	9:00-10:00
PolS	564	Central and Eastern Europe (3 cr.)	M. W. F.	10:00-11:00
PolS	575	American Political Parties— Sec. 1 (3 cr.)	M. W. F.	11:00-12:00
PolS	575	American Political Parties— Sec. 2 (3 cr.)	M. W. F.	12:00- 1:00
PolS	576	Legislative Process—Sec. 1 (3 cr.)	M. W.	4:00- 5:15
PolS	576	Legislative Process—Sec. 2 (3 cr.)	M. W.	6:00- 7:15
PolS	579	Modern Political Thought (3 cr.)	M. W. F.	1:00- 2:00
PolS	580	Public Opinion (3 cr.)	M. W. F.	2:00- 3:00
PolS	583	Federal Administrative Policy (3 cr.)	M. W. F.	3:00- 4:00
PolS	584	Judicial Process—Sec. 1 (3 cr.)	T. Th.	9:30-10:45
PolS	584	Judicial Process—Sec. 2 (3 cr.)	T. Th.	1:30- 2:45
PolS	599	Political Science Internship (1-6 cr.)	To be arranged	
Psy	512	Human Learning and Memory	M. W. F.	1:00- 2:00
Psy	514	Motivation	Tr	9:30-10:45
Psy	517	Social Psychology	Tr	2:00- 3:15
Psy	561	Advanced Psychological Practicum (Departmental Consent required)	To be arranged	
Psy	571	Independent Study in Psychology (Psy major or minor)	To be arranged	
SpE	555	Practicum and Internship (2-4 cr.)	To be arranged	

**TENTATIVE SCHEDULE OF CLASSES FOR
PRE-SUMMER SESSION, 1972**

			Period
Anthro	591	Studies in Anthropology	2
Art	513	Research and Philosophy in Art Education	2
Art	547	Graduate Studio in Jewelry and Metal Work I	1
Art	548	Graduate Studio in Jewelry and Metal Work II	1
Art	549	Graduate Studio in Jewelry and Metal Work III	1
Art	568	Graduate Studio Printmaking I	1
Art	569	Graduate Studio Printmaking II	1
Art	570	Graduate Studio Printmaking III	1
Bio	600	Methods of Research in Biology	1
Bus	534	Consumer Economic Problems	2
Bus	550	Principles and Problems of Business Education	1
Chem	500	Special Studies	1
Chem	533	Chemical Literature	1
Chem	613	Chemistry of the Representative Elements	2
CnEd	526	Information Service (El.)	1
CnEd	527	Consultative and Counseling Theory (El.)	2
CnEd	531	Philosophy and Principles of Guidance	2
CnEd	533	Evaluation Techniques: Principles	1
CnEd	536	Information Service (Sec.)	1
CnEd	537	Counseling and Consultative Theory (Sec.)	2
Econ	525	Monetary Economics I	1
Econ	552	Comparative Economic Systems	2
EdPsy	511	Introduction to Educational Specialists	1
EdPsy	550	Clinical Practicum	1
EdPsy	576	Advanced Studies in Behavior Problems	1
El	500	Basic Foundations of Reading Instruction	2
El	511	The Teaching of Reading in the Secondary Schools	2
El	531	Curriculum Problems in Elementary Education	1
El	541	Special Problems in Elementary Social Studies	1
El	551	Recent Innovations in Elementary Education	1
El	561	Early Childhood Philosophy and Principles	1
ElMath	501	Basic Concepts in Mathematics I	2
ElMath	515	Intuitive Topology	2
ElMath	542	Mathematics in the Elementary School	1
ElSc	530	Quantitative Tools for Elementary Science	2
ElSc	588	Field Natural History of Western Pennsylvania	1
Eng	556	Modern British Poetry	1
Eng	565	The Faust Literature	1
Eng	573	Major Writers: Whitman	1
Eng	578	Major Writers: Spencer	2
Eng	582	Major Writers: Wordsworth and Coleridge	2
Eng	590	Major Writers: Twain	2
Eng	591	Major Writers: Frost and Robinson	2
Geog	521	Advanced Human (Non-majors)	1
Geog	522	Aero-Space (Non-majors)	1
Geog	531	Geography of Europe	2
Geog	591	Geography Thought and Philosophy	2
Geol	510	Pennsylvania Geology	2
Geol	591	Field and Laboratory Investigation in Geoscience	1
Grad	550	Thesis and Research	2
HE	540	Advanced Human Nutrition	1
HE	571	Curriculum Development in Home Economics	2
HE	574	Seminar in Home Economics Education	1
Hist	501	Historiography	1
Hist	511	Readings in History	2
Hist	552	History of England to 1688	1
Hist	554	History of Russia to 1917	2

LRes	501	Classroom Use of Motion Pictures	1
LRes	506	Evaluation of Research and Mass Media	2
Math	510	Seminar in Mathematics I	2
Math	600	Methods of Research in Mathematics	1
Mus	532	Seminar in Music Education	2
Mus	537	Techniques of the Marching Band	1
PolS	514	Research Methodologies in the Social Sciences	1
PolS	573	Regional Political Studies	1
PolS	578	Constitutional Law and Civil Liberties	1
Phil	580	Studies in Religious Thought	2
Phil	582	Problems of Ethics	1
Phys	512	Curriculum Development in Secondary Schools	1
Psy	530	Psychology of Growth and Development	1
Psy	531	Psychology of Exceptional Children and Youth	1
Psy	533	Psychology of Personality	2
Psy	534	Abnormal Psychology	2
Psy	540	Community Psychology and Mental Health	1
Sci	575	Growth of Science and Its Concepts I	2
SpH	532	Adult Aphasia	1
SpH	561	Advanced Clinical Practicum I	Hours Arranged
SpH	663	Advanced Clinical Practicum II	Hours Arranged
SS	510	New Approaches in Social Science Instruction	2
SS	521	Contemporary American Issues (Non-majors)	2

TENTATIVE SCHEDULE OF CLASSES FOR MAIN SUMMER SESSION, 1972

Anth	591	Studies in Anthropology	2
Anth	595	Pre-History	3
Art	511	Curriculum Development, Supervision and Administration in Art Education	2
Art	521	Contemporary Movements in Art	2
Art	525	Architectural Influences in a Contemporary Society	3
Art	540	Graduate Studio in Ceramics I	4
Art	541	Graduate Studio in Ceramics II	4
Art	542	Graduate Studio in Ceramics III	4
Art	544	Graduate Studio in Fabrics I	3
Art	545	Graduate Studio in Fabrics II	3
Art	546	Graduate Studio in Fabrics III	3
Art	561	Graduate Studio in Drawing	2
Art	565	Graduate Studio in Water Color Painting I	4
Art	566	Graduate Studio in Water Color Painting II	4
Art	567	Graduate Studio in Water Color Painting III	4
Art	571	Graduate Studio in Mural Painting	3
Astro	540	Operation of Planetarium	3
Bio	530	Instrumentation	2
Bio	560	Herpetology	4
Bio	578	Mycology	3
Bio	612	Biology Seminar	1
Bus	501	Principles of Tax Accounting	2
Bus	510	Business Communications and Report Writing	1
Bus	514	Executive Secretarial Training	3
Bus	521	Principles of Marketing	1
Bus	523	Marketing Research	3
Bus	531	Principles of Investment in Securities	3
Bus	532	Current Business Economic Problems	4
Bus	533	Case Problems in Business Law	1
Bus	536	Automated Data Processing I (Lecture and Lab)	4
Bus	541	Principles of Management	2
Bus	542	Human Relations in Business	2

Bus	552	Seminar in Business Education	3
Bus	561	Improvement of Instruction in Basic Business Courses	2
Bus	562	Improvement of Instruction of Accounting and Business Math	1
Bus	563	Improvement of Instruction in Office Practice	4
Bus	570	Economic Background in Business (Non-majors)	4
Chem	500	Special Studies	3
Chem	630	Organic Chemistry	1
Chem	652	Enzymes	2
CnEd	524	Evaluation Techniques: Application (El.)	4
CnEd	526	Information Service in Guidance (El.)	3
CnEd	531	Philosophy and Principles of Guidance	3
CnEd	533	Evaluation Techniques: Principles	1
CnEd	534	Evaluation Techniques: Applications (Sec.)	4
CnEd	536	Information Service in Guidance (Sec.)	3
CnEd	538	Management of Guidance Services	2
CnEd	540	Supervised Practicum (El.)	3
CnEd	541	Supervised Practicum (Sec.)	1
CnEd	545	Human Relations and Communications	2
CnEd	546	Encounter and Sensitivity in Counseling	2
CnEd	550	Supervision of Guidance Workers (Sec.)	1 & 3
Econ	525	Monetary Economics I	1
Econ	555	Labor Economics	3
Econ	556	History of Economic Thought	2
EdPsy	502	Advanced Educational Psychology	1
EdPsy	518	Interpretation of Psychological Tests for Reading Specialists	2
EdPsy	532	Studies in Pupil Adjustment	3
EdPsy	550	Clinical Practicum	3
EdPsy	573	Advanced Psychology of Adolescent Education	2
El	500	Basic Foundations of Reading Instruction	2
El	501	Classroom Diagnosis and Remediation of Reading	4
El	502	Practicum in Reading	1, 2, 3, 4
El	503	Reading Practicum: Remedial Case Studies	1, 2, 3, 4
El	543	Resource Materials in Elementary Science	2
El	544	Recent Trends in Elementary Language Arts	3
El	545	Experimental Studies in Art Education	1
El	547	Resource Materials in Children's Literature	1
El	548	Creativity and the Elementary School Child	4
El	550	The Community and the Elementary School	3
El	551	Recent Innovations in Elementary Education	4
El	552	Evaluating the Elementary School	2
El	553	Supervision and Improvement of Instruction in the Elementary School	1
El	555	Recent Trends in Human Development and Learning	1
El	560	Early Childhood Study Techniques and Resources	1
El	562	Early Childhood Curriculum and Materials	1
ElMath	502	Basic Concepts of Mathematics II	1
ElMath	509	Introduction to Number Theory	1
ElMath	512	Coordinate Geometry and Trigonometry II	2
ElMath	520	Curriculum and Instruction in El. School Math Programs	4
ElSc	510	Education in the Out-of-Doors	3
ElSc	511	Education in the Out-of-Doors	4
ElSc	568	Field Biology I	3
ElSc	569	Field Biology II	4
Eng	510	Bibliographical Methods in English, Sections 1 and 2	2 & 3
Eng	512	American English Grammar	3
Eng	515	Shakespeare I	4
Eng	517	Elizabethan Drama	1
Eng	525	The Early English Drama	4

Eng	545	The Age of Pope	1
Eng	548	Victorian Prose and Poetry	1
Eng	550	Workshop in Play Production	All Day
Eng	553	The American Renaissance	3
Eng	561	Tragic Themes of Classic Drama	1
Eng	567	Literary Britain	No Period
Eng	570	Major Writers: Hawthorne and Thoreau	4
Eng	583	Major Writers: Byron, Keats and Shelley	2
Eng	588	Major Writers: G. B. Shaw	2
Eng	592	Major Writers: T. S. Eliot	2
Eng	593	Major Writers: Fitzgerald and Lewis	3
Eng	600	Seminar in British Literature to 1500	3
Eng	610	Seminar in British Literature—Renaissance (1500-1660)	1
Eng	695	Seminar in Linguistics	2
Fl	521	Language and Society	1
Geog	510	Internship: Community College Teaching	1
Geog	541	Agricultural Geography	2
Geog	589	Cartography	3
Geog	592	Research	4
Geol	503	Earth Processes	2
Geol	504	Earth History	1
Geol	516	Petrology	4
Geol	518	Economic Mineral Deposits	3
Grad	515	Elements of Research (EEd Majors)	1
Grad	515	Elements of Research	2
Grad	515	Elements of Research (CnEd Majors)	1
Grad	516	Statistical Methods	2
Grad	550	Research and Thesis	4
HE	531	Creative Clothing	2
HE	551	Seminar in Home Management and Family Economics	4
HE	572	Evaluation in Home Economics Education	3
HE	577	Independent Study (By permission of Dept. Chairman)	1
HE	578	Research in Home Economics Education	1
Hist	510	Teaching in Community College Internship	1 & 2
Hist	512	Readings in History	2
Hist	522	History Seminar	4
Hist	531	Economic and Social History of Pennsylvania	4
Hist	534	Recent History of U. S.	3
Hist	541	Modern European Problems	2
Hist	544	History Seminar	3
Hist	553	History of England from 1688	2
Hist	554	History of Soviet Russia	4
LRes	500	Seminar in Learning Resources	1
LRes	502	Programmed Learning in Education	2
LRes	515	Role of Learning Resources—Theoretical and Research Foundations	3
LRes	530	Classification and Cataloging of Learning Resources	1
LRes	541	Photographic Fundamentals for Educational Materials	3
LRes	549	Television Production and Direction	4
Math	530	Differential Equations II	3
Math	532	Advanced Calculus II	1
Math	534	Functions of a Complex Variable II	1
Math	544	Vector Analysis II	4
Math	562	Abstract Algebra II	2
Math	563	Linear Algebra I	3
Math	564	Linear Algebra II	4
Math	565	Theory of Groups	4
Math	572	Modern Geometry II	1
Math	584	Mathematical Statistics I	2
Mus	504	Music of the Classic Era	1
Mus	510	Seminar in Music Literature	4

Mus	512	Advanced Orchestration	2
Mus	513	Advanced Band Scoring	2
Mus	528	Contemporary International Approaches to Music Education	3
Mus	670	Applied Music	By Appointment
Phil	581	Problems of Logic	3
Phil	583	American Philosophic Thought	1
Phys	522	Advanced Laboratory Practice II	3
Phys	535	Electronics	4
Phys	542	Analytical Mechanics II	2
Phys	565	Intro to Nuclear Physics	1
PolS	510	Community College Teaching Internship in Political Science, Section 1. (Permit to Enter)	3 & 4
PolS	521	Contemporary American Issues (Non-majors)	2
PolS	571	Foreign Policy Studies	1
PolS	574	Political Science Seminar	2
PolS	575	American Political Parties	3
PolS	580	Public Opinion	1
PolS	581	The Presidency	3
PolS	584	Judicial Process	2
PolS	599	Political Science Internship	4
Psy	510	Community College Teaching Internship	3
Psy	517	Social Psychology	3
Psy	530	Psychology of Growth and Development	1
Psy	533	Psychology of Personality	2
Psy	534	Abnormal Psychology	2
Psy	536	Psychology of Learning	2
Psy	540	Community Psychology and Mental Health	1
Psy	561	Advanced Psychological Practicum	To be arranged
Psy	539	Psychology of the Mentally Retarded	1
Sci	576	Growth of Science and Its Concepts II	3
Soc	562	Deviant Behavior	2
Span	512	Advanced Composition and Conversation	2
Span	520	Medieval Spanish Literature	4
SpE	520	Curriculum and Methods	3
SpH	510	Articulation	1
SpH	550	Speech Science	2
SpH	561	Advanced Clinical Practicum I	Hrs. Arranged
SpH	663	Advanced Clinical Practicum II	Hrs. Arranged
SS	514	Research Methodologies in Social Science	1

TENTATIVE SCHEDULE OF CLASSES FOR POST-SUMMER SESSION, 1972

Art	522	Art in America	1
Art	562	Graduate Studio in Oil Painting I	2
Art	563	Graduate Studio in Oil Painting II	2
Art	564	Graduate Studio in Oil Painting III	2
Bio	522	Biometry	1
Bus	551	Administration and Supervision of Business Education	1
Chem	500	Special Studies	2
Chem	602	Chemistry in Manufacturing Processes	1
Chem	620	Analytical Chemistry	1
CnEd	524	Evaluation Techniques: Applications (El.)	2
CnEd	525	Case Study Techniques (El.)	1
CnEd	529	Group Procedures (El.)	1
CnEd	534	Evaluation Techniques: Applications (Sec.)	2
CnEd	535	Case Study Techniques (Sec.)	1
CnEd	539	Group Procedures (Sec.)	1
Econ	553	Contemporary Economic Issues	1

Econ	555	Labor Economics	2
EdPsy	532	Studies in Pupil Adjustment	1
EdPsy	573	Advanced Psychology of Adolescent Education	1
El	508	Instructional Materials in Reading for Youth	1
El	531	Curriculum Problems in Elementary Education	1
El	541	Special Problems in Elementary Social Studies	1
El	554	Administration of the Elementary School	2
ElMath	503	Foundations of Algebra I	2
ElMath	512	Introduction to Probability and Statistics	2
ElSc	566	Conservation	1
ElSc	570	Geology	1
ElSc	574	Meteorology	2
Eng	557	Modern American Poetry	2
Eng	571	Major Writers: Faulkner and Hemingway	1
Eng	576	Major Writers: Conrad	1
Eng	581	Major Writers: Swift	2
Eng	585	Major Writers: Dickens	2
Geog	542	Industrial Geography	1
Geog	560	Urban Planning Seminar	1
Geog	594	Field Techniques in Geography	2
Geos	498	Problems in Geoscience (Permit to Enter)	2
Grad	515	Elements of Research (El. Ed.)	2
Grad	517	Statistical Methods II	2
Grad	550	Research and Thesis	2
HE	522	Seminar in Human Development	1
HE	596	Study Four in Oriental Family Life	1
Hist	543	Modern Asian-African Problems	2
Hist	591	Social and Intellectual History of U. S. since 1875	1
LRes	500	Seminar in Learning Resources	1
LRes	540	Preparation of Learning Resources	2
Math	511	Seminar in Mathematics II	1
Mus	533	Comparative Choral Methods	1
Phil	580	Studies in Religious Thought	1
PolS	576	Legislative Process	1
PolS	579	Modern Political Thought	1
Psy	530	Psychology of Growth and Development	1
Psy	531	Psychology of Mentally Retarded	1
Psy	533	Psychology of Personality	2
Psy	534	Abnormal Psychology	2
Sci	572	Experimental Techniques in Chemistry and Physics	2
SS	514	Research Methodologies in Social Science	1
SS	521	Contemporary American Issues (Non-majors)	2
SS	561	Social Policy Studies	2

TENTATIVE SCHEDULE OF CLASSES FOR

FALL, 1972

TUESDAY EVENINGS

(5:30-7:10 P.M.)

Art	513	Research and Philosophy in Art Education
Bio	600	Methods of Research in Biology
Bus	570	Economic Background in Business
Chem	640	Physical Chemistry 3 cr. (5:30-8:15)
CnEd	526	Information Service (El.)
CnEd	536	Information Service (Sec.)
CnEd	540	Supervised Practicum (El.) 4 cr.
CnEd	550	Supervision of Guidance Workers (El.) 4 cr.
EdPsy	502	Advanced Educational Psychology

El	503	Reading Practicum: Remedial Case Studies
ElSc	550	Physics I
Eng	510	Bibliographical Methods in English, Sec. 1
Eng	539	Metaphysical Poets
Fl	521	Language and Society
Geog	514	Quantitative Techniques in Geography
Geol	515	Mineralogy—Additional Lab Time to be Allowed
HE	541	Advanced Foods and Gourmet Cookery
Hist	521	History Seminar
LRes	543	Slide and Filmstrip Production
Math	531	Advanced Calculus I
Math	533	Functions of a Complex Variable I
Mus	505	Music of the Romantic Era
Phys	641	Advanced Mechanics I
Psy	540	Community Psychology and Mental Health
Psy	501	Research Methods in Psychology I
SpE	555	Practicum and Internship
SpH	512	Cleft Palate
SS	521	Contemporary American Issues (Non-majors)

TUESDAY EVENINGS

(7:30-9:10 P.M.)

Art	524	Art of the East
Bio	530	Instrumentation
Bus	552	Seminar in Business Education
Chem	546	Biochemistry I
CnEd	527	Consultative and Counseling Theory (El.)
CnEd	537	Counseling Consultative Theory (Sec.)
CnEd	538	Management of the Guidance Services
EdPsy	532	Studies in Pupil Adjustment
El	500	Basic Instruction of Reading Instruction
ElMath	542	Mathematics in the Elementary School
ElSc	560	Botany I
Eng	537	Modern American Fiction
Eng	670	Seminar in American Literature (to 1870)
HE	530	Clothing and Human Behavior
Hist	511	Readings in History
LRes	506	Evaluation of Research in Mass Media
Math	561	Abstract Algebra I
Math	562	Abstract Algebra II
Mus	501	Advanced Choral Conducting
Phil	582	Problems of Ethics
Phys	600	Methods of Research in Physics
SpH	640	Theories of Hearing

WEDNESDAY EVENINGS

(5:30-7:10 P.M.)

Art	527	Renaissance Art
Bio	580	Parasitology
Bus	543	Leadership Development in Business and Distrib. Education
Chem	610	Inorganic Chemistry 3 cr. (5:30-8:15)
CnEd	544	Organizing Principles
CnEd	545	Human Relations and Communications
CnEd	546	Encounter and Sensitivity in Counseling
EdPsy	576	Advanced Studies in Behavior Problems
El	511	The Teaching of Reading in the Secondary Schools
El	544	Recent Trends in Elementary Language Arts
ElMath	505	Principles of Geometry I
ElSc	592	Elementary Science Curriculum

Eng	510	Bibliographical Methods in English, Sec. 2
Eng	583	Major Writers: Byron, Keats and Shelly
HE	578	Research in Home Economics Education
Hist	501	Historiography
Hist	543	Modern Asian-African Problems
Math	543	Vector Analysis I
Math	600	Methods of Research in Mathematics
Mus	500	Bibliography of Music
Phys	652	Advanced Electromagnetic Theory II
Psy	530	Psychology of Growth and Development
Span	521	Seminar on Cervantes
SpE	540	Diagnostic Techniques in Special Education

WEDNESDAY EVENINGS

(7:30-9:10 P.M.)

Art	510	Art and the Exceptional Child
Bio	583	Immunology
Bus	521	Principles of Marketing
CnEd	529	Group Procedures (El.)
CnEd	539	Group Procedures (Sec.)
CnEd	542	School Services
CnEd	551	Evaluation of Guidance Services
EdPsy	550	Clinical Practicum
EdPsy	573	Advanced Psychology of Adolescent Education
El	547	Resource Materials in Children's Literature
ElMath	504	Foundations of Algebra II
Eng	536	Middle English Ballads, Lyrics and Romances
Eng	555	Realism in American Fiction
Geog	553	Political Geography
HE	573	Supervision and Administration in Home Economics Education
Hist	522	Seminar
Math	571	Modern Geometry I
Math	580	Logic
Mus	534	Comparative Instrumental Methods
Phys	661	Quantum Mechanics II
Span	522	Seminar on Perez Galdos

THURSDAY EVENINGS

(5:30-7:10 P.M.)

Art	521	Contemporary Movements in Art
Art	568	Graduate Studio in Printmaking I
Art	569	Graduate Studio in Printmaking II
Art	570	Graduate Studio in Printmaking III
Bio	557	Animal Morphogenesis
Chem	522	Advanced Instrumental Methods of Analysis
CnEd	525	Case Study Techniques (Elem.)
CnEd	533	Evaluation Techniques: Principles
CnEd	535	Case Study Techniques (Sec.)
CnEd	541	Supervised Practicum (Sec.) 4 cr.
CnEd	550	Supervision of Guidance Workers (Sec.) 4 cr.
El	555	Recent Trends in Human Development and Learning
Eng	572	Major Writers: Thomas Hardy
HE	577	Independent Study in Home Economics
Hist	546	History of Europe 1815-1914 (By permission of Dept. Chairman)
LRes	548	Writing for Radio and Television
Math	563	Linear Algebra I
Math	585	Mathematical Statistics II

Phys	504	Theoretical Physics III
Psy	525	Theory and Techniques of Psychological Intervention
Soc	564	Sociology Seminar
SpE	520	Curriculum and Methods
SS	510	New Approaches in Social Science Teaching
SS	514	Research Methodologies in Social Science

THURSDAY EVENINGS

(7:30-9:10 P.M.)

Bio	563	Physiology of Plants
CnEd	531	Philosophy and Principles of Guidance
EdPsy	578	Advanced Seminar in Learning Problems
El	550	The Community and the Elementary School
Eng	513	The English Language from Beginnings to 1500
Eng	546	The Age of Johnson
Geog	524	Cultural Geography
Geol	508	Glacial Geology
Grad	515	Elements of Research (CnEd Majors)
Hist	542	Contemporary Latin American Problems
LRes	549	Television Production and Direction
Math	564	Linear Algebra II
Mus	501	Applied Music
Phys	657	Solid State Theory I

SATURDAY MORNINGS

(9:00-10:40 A.M.)

Art	547	Graduate Studio in Jewelry and Metal Work I
Art	548	Graduate Studio in Jewelry and Metal Work II
Art	549	Graduate Studio in Jewelry and Metal Work III
Bio	548	Plant Ecology
Bus	560	Improvement of Instruction in Secretarial Courses
Eng	543	The British Novel of the 18th Century
Eng	588	Major Writers: G. B. Shaw
Eng	690	Seminar in Literary Criticism
Geog	530	Geography U.S.S.R.
Hist	532	U. S. - British Commonwealth Relations
Math	552	Number Theory
Math	582	Theory of Probability
Phys	502	Theoretical Physics I
SpE	565	Education of Children with Social-Emotional Maladjustments
SpH	514	Cerebral Palsy

SATURDAY MORNINGS

(11:00 A.M.-12:40 P.M.)

Anth	593	Science of Culture
Art	553	Graduate Studio in Crafts I
Art	554	Graduate Studio in Crafts II
Art	555	Graduate Studio in Crafts III
Eng	573	Major Writers: Whitman
Eng	584	Major Writers: Tennyson and Browning
GeoS	570	Physical Oceanography I
Grad	516	Statistical Methods I

DAYTIME CLASSES

Chem	500	Special Studies	Hours Arranged
Chem	600	Seminar	F. 4:00

Chem	623	Physical and Chemical Methods of Separation	T. Th. 11:00, F. 8:00-12:00
Econ	525	Monetary Economics I, Multiple Sections	See Chairman
Econ	553	Contemporary Economic Issues	M. W. F. 12:00
Econ	555	Labor Economics, Multiple Sections	See Chairman
Econ	556	History of Economic Thought	T. Th. 11:00-12:15
Eng	610	Seminar in British Literature-Renaissance	M. 3:00- 5:30
Geog	516	Historical Geography of Cities and City Planning	M. W. F. 5:00
Geog	519	Urban Planning Basic Studies and Analysis	M. W. F. 4:00
Geog	589	Cartography	T. Th. 5:30
Geog	592	Research	T. 7:30
Grad	550	Research and Thesis	Hours Arranged
Grad	650	Dissertation	By Appointment
Hist	552	History of England to 1688	M. W. F. 10:00
Hist	554	History of Russia to 1917	M. W. F. 1:00
Hist	590	Social and Intellectual U. S. to 1875	M. W. F. 9:00
Math	561	Abstract Algebra I	M. W. F. 9:00
Math	563	Linear Algebra I	M. W. F. 10:00
Math	582	Theory of Probability	M. W. F. 11:00
Math	531	Advanced Calculus I	M. W. F. 1:00
Phys	522	Advanced Laboratory Practice II	T. Th. 8:00-11:00
Phys	531	Atomic Structure	M. W. F. 9:00
Phys	542	Analytical Mechanics II	M. W. F. 11:00
Phys	552	Electricity and Magnetism II	M. W. F. 10:00
Phys	561	Quantum Mechanics I	M. W. F. 9:00
PolS	575	American Political Parties	M. W. F. 10:00
PolS	577	Metropolitan Problems	M. W. F. 11:00
PolS	578	Constitutional Law and Civil Liberties	M. W. F. 12:00
PolS	581	The Presidency	M. W. F. 1:00
PolS	585	Political Philosophy	M. W. F. 2:00
PolS	591	Studies in Political Science	M. W. F. 3:00
PolS	599	Political Science Internship (Approval of Instructor required)	Hours Arranged
Sci	575	Growth of Science and Its Concepts	M. W. 5:00- 6:15
SpH	561	Advanced Clinical Practicum I	Hours Arranged
SpH	663	Advanced Clinical Practicum II	Hours Arranged

TENTATIVE SCHEDULE OF CLASSES FOR SPRING, 1973

TUESDAY EVENINGS (5:30-7:10 P.M.)

Anth	592	Comparative Cultures
Art	522	Art in America
Bio	612	Biology Seminar
Bus	522	Sales Promotion and Advertising
CnEd	526	Information Service (El.)
CnEd	536	Information Service (Sec.)
CnEd	540	Supervised Practicum (El.) 4 cr.
CnEd	550	Supervision of Guidance Workers (El.) 4 cr.
EdPsy	502	Advanced Education Psychology
Ei	503	Reading Practicum: Remedial Case Studies
ElSc	551	Physics II
Eng	510	Bibliographical Methods in English
HE	574	Seminar in Home Economics Education
Hist	512	Readings in History
Hist	542	Contemporary Latin American Problems
LRes	503	Writing for A. V. Production

Math	532	Advanced Calculus II
Math	565	Theory of Groups
Mus	507	Music of the 20th Century
Phys	642	Advanced Mechanics II
SpII	530	Childhood Aphasia

TUESDAY EVENINGS

(7:30-9:10 P.M.)

Art	511	Curriculum Development, Supervision and Administration in Art Ed.
Bio	566	Cellular Physiology
Bus	541	Principles of Management
Chem	547	Biochemistry II
CnEd	527	Consultative and Counseling Theory (El.)
CnEd	537	Counseling and Consultative Theory (Sec.)
CnEd	538	Management of Guidance Services
EdPsy	532	Studies in Pupil Adjustment
El	501	Classroom Diagnosis and Remediation of Reading
ElSc	561	Botany II
Eng	522	Chaucer
Eng	547	Romantic Prose and Poetry
Eng	630	Seminar in British Literature, Restoration and 18th Century
Geog	525	Africa: South of Sahara
HE	532	Recent Developments in Textiles
Hist	531	Economic and Social History of Pennsylvania
LRes	545	Advanced Motion Picture Production for Education
Math	562	Abstract Algebra II
Math	576	Projective Geometry II
Mus	509	Biography
Phil	581	Problems of Logic
Phys	512	Curriculum Developments in Secondary School Physics
PolS	573	Regional Political Studies
SpH	650	Experimental Phonetics

WEDNESDAY EVENINGS

(5:30-7:10 P.M.)

Art	525	Architectural Influences in a Contemporary Society
Bio	586	Taxonomy and Ecology of Bacteria
Bus	534	Consumer Economic Problems
Chem	620	Analytical Chemistry 3 cr. (5:30-8:15)
CnEd	543	Planning Principles 4 cr.
CnEd	545	Human Relations and Communications
CnEd	546	Encounter and Sensitivity in Counseling
EdPsy	565	Seminar in Problems of School Psychologist
EdPsy	576	Advanced Studies in Behavior Problems
El	508	Instructional Materials in Reading for Youth
ElMath	506	Principles of Geometry II
ElSc	580	Astronomy
Eng	576	Major Writers: Conrad
HE	570	Home Economics in American Education
Hist	534	Recent History of U. S.
Hist	543	Modern Asian-African Problems
Math	552	Number Theory
Math	564	Linear Algebra II
Mus	514	Advanced Choral Arranging
Phys	651	Advanced Electromagnetic Theory I
Sci	572	Experimental Techniques of Chemistry and Physics
Soc	563	Intergroup Relations
Span	523	Seminar on the Generation of 1898
SpE	560	Selected Problems and Research

WEDNESDAY EVENINGS

(7:30-9:10 P.M.)

Art	528	World Art Since 1875
Bio	568	Biology Practicum
Bus	510	Business Communications and Report Writing
CnEd	529	Group Procedures (El.)
CnEd	539	Group Procedures (Sec.)
CnEd	542	School Services
EdPsy	550	Clinical Practicum
EdPsy	573	Advanced Psychology of Adolescent
ElMath	510	Introduction to Logic and Boolean Algebra
Eng	528	Milton (7:10-9:40)
Eng	541	The Rise of American Regionalism (7:10-9:40)
Eng	600	Seminar in British Literature to 1500
Geog	513	Population Geography
HE	522	Seminar in Human Development
Hist	555	History of Soviet Russia
Math	531	Advanced Calculus I
Math	574	Topology II
Mus	516	Analytical Techniques
Phil	583	American Philosophic Thought
Phys	662	Quantum Mechanics III
Span	524	Hispanic Poetry Since 1888

THURSDAY EVENINGS

(5:30-7:10 P.M.)

Art	521	Contemporary Movements in Art
Bio	576	Radiation Biology
Chem	630	Organic Chemistry (5:30-8:15)
CnEd	524	Evaluation Techniques: Applications (El.)
CnEd	525	Case Study Techniques (El.)
CnEd	534	Evaluation Techniques: Applications (Sec.)
CnEd	535	Case Study Techniques (Sec.)
CnEd	541	Supervised Practicum (Sec.) 4 cr.
CnEd	550	Supervision of Guidance Workers (Sec.) 4 cr.
El	507	Instructional Materials in Reading for Children (K-6)
Eng	579	Major Writers: Alexander Pope
Grad	516	Statistical Methods
HE	577	Independent Study in Home Economics Education
Hist	501	Historiography
Hist	541	Modern European Problems
Hist	554	History of Russia to 1917
LRes	515	Role of Learning Resources: Theoretical and Research Foundations
Math	536	Functions of a Real Variable II
Mus	501	Applied Music
Phys	505	Theoretical Physics IV
PolS	572	Comparative Political Studies
SpE	521	Curriculum and Methods

THURSDAY EVENINGS

(7:30-9:10 P.M.)

Art	510	Art and the Exceptional Child
Bio	575	Mammalogy
Bus	542	Human Relations in Business
CnEd	531	Philosophy and Principles of Guidance
EdPsy	518	Interpretation of Psychological Tests for Reading Specialists
Eng	516	Shakespeare II

Eng	532	Colonial American Literature
Eng	548	Victorian Prose and Poetry
Geog	512	Settlement Geography
Geos	572	Theoretical Meteorology
Grad	515	Elements of Research (CnEd Majors)
Hist	544	History Seminar
LRes	560	Management of Learning Resources
Math	540	Infinite Series II

SATURDAY MORNINGS

(9:00-10:00 A.M.)

Art	544	Graduate Studio in Fabrics I
Art	545	Graduate Studio in Fabrics II
Art	546	Graduate Studio in Fabrics III
Bus	550	Principles and Problems in Business Education
El	531	Curriculum Problems in Elementary Education
Eng	544	The Psychology of Language
Eng	589	Major Writers: Melville
Eng	660	Seminar in Modern British Literature
Geog	542	Industrial Geography
Hist	521	History Seminar
Math	584	Mathematical Statistics I
Math	600	Methods of Research in Mathematics
Phys	503	Theoretical Physics II
PolS	574	Political Science Seminar
SpE	522	Orientation to Rehabilitation
SpH	504	Diagnostic Methods

SATURDAY MORNINGS

(11:00 A.M.-12:40 P.M.)

Art	565	Graduate Studio in Water Color Painting I
Art	566	Graduate Studio in Water Color Painting II
Art	567	Graduate Studio in Water Color Painting III
Geos	571	Physical Oceanography
Grad	515	Elements of Research
Hist	511	Readings in History
Math	561	Abstract Algebra
Phys	531	Atomic Structure

DAYTIME CLASSES

Chem	500	Special Studies	Time Arranged
Chem	600	Seminar	F. 4:00
Chem	621	Electroanalytical Chemistry	T. Th. 11:00, F. 8:00-12:00
Chem	632	Stereochemistry	M. W. F. 11:00
Econ	525	Monetary Economics I	See Chairman
Econ	553	Contemporary Economic Issues	M. W. F. 12:00-12:50
Econ	554	Economic Seminar	T. Th. 11:00-12:15
Econ	555	Labor Economics	See Chairman
Eng	680	Seminar in Modern American Literature	M. 3:00- 5:30
Geog	517	General City Planning	M. W. F. 5:00
Geog	518	Urban Design	M. W. F. 3:00
Geog	590	Map and Photo Interpretation	M. W. 5:00- 6:15
Geog	591	Geographic Thought	T. Th. 5:00- 6:15
Grad	550	Research and Thesis	To Be Arranged
Grad	650	Dissertation	By Appointment
Hist	553	History of England Since 1688	M. W. F. 10:00
Hist	591	Social and Intellectual History of U. S. Since 1875	M. W. F. 9:00

Math	531	Advanced Calculus I	M. W. F.	10:00
Math	532	Advanced Calculus II	M. W. F.	1:00
Math	562	Abstract Algebra II	M. W. F.	9:00
Mus	501	Applied Music	To Be Arranged	
Phys	521	Advanced Laboratory Practice I	T. Th.	8:00-11:00
Phys	533	Heat and Thermodynamics	M. W. F.	2:00
Phys	551	Electricity and Magnetism I	M. W. F.	10:00
Phys	565	Intro to Nuclear Physics	M. W. F.	9:00
PolS	560	Political Systems: Latin American	M. W. F.	9:00
PolS	575	American Political Parties	M. W. F.	10:00
PolS	576	Legislative Process	T. Th.	3:00- 4:45
PolS	579	Modern Political Thought	M. W. F.	11:00
PolS	580	Public Opinion	M. W. F.	12:00
PolS	584	Judicial Process	M. W. F.	12:00
PolS	599	Political Science Internship	M. W. F.	1:00
Psy	511	Conditioning and Learning	M. W. F.	1:00- 2:00
Psy	515	Perception	Tr.	2:00- 3:15
Psy	516	Physiological Psychology	M. W. F.	3:00- 4:00
Psy	561	Advanced Psychological Practicum	To be arranged	
Psy	570	Seminar in Psychology	To be arranged	
Psy	571	Independent Study in Psychology	To be arranged	
Sci	576	Growth of Science and Its Concepts	M. W.	5:00- 6:15
SpH	561	Advanced Clinical Practicum I	Hours Arranged	
SpH	663	Advanced Clinical Practicum II	Hours Arranged	

THE GRADUATE SCHOOL

Indiana University of Pennsylvania
Indiana, Pennsylvania

GENERAL INFORMATION

Location

Indiana University of Pennsylvania is located in Indiana, Pennsylvania, a community with a population of approximately 20,000. Indiana is 30 miles north of Johnstown and 60 miles northeast of Pittsburgh. Situated in the foothills of the Allegheny Mountains, Indiana has a climate that is conducive to study the year round.

University Catalog

Detailed information about the University, its academic requirements, the names of the faculty, and the facilities are described in the general catalog. This publication may be obtained by writing to the Registrar.

HISTORY OF THE GRADUATE SCHOOL

Graduate work was inaugurated at Indiana University of Pennsylvania in September, 1957.

Programs leading to the degrees Master of Education, Master of Arts, Master of Science, Doctor of Education, and Doctor of Philosophy are now available. Non-degree programs leading to certification as Learning Resources Specialist, Reading Specialist, and School Psychologist are now available. During the calendar year 1970 the institution conferred the Master's Degree on 256 graduate students: 183 the M.Ed., 62 the M.A., and 11 the M.S.

In all graduate programs the objectives are (1) to encourage excellence in scholarship, (2) to provide for depth in the student's special field, and (3) to stimulate enthusiasm for continued cultural and professional growth.

Library

The University Library provides excellent facilities for graduate work with professional librarians readily available for assisting with specialized reference work.

The present book collection of 407,000 volumes grows at the rate of approximately 50,000 volumes annually. In addition there are extensive holdings of periodicals (about 2900 current titles),

microfilms, Microcards, curriculum materials, federal and state documents, and phonograph records.

The Rhodes R. Stabley Library was opened in 1961. It is designed to give efficient service through a uniform flow of library materials in an attractive, but functional setting. At least one professional librarian is always on duty to provide reference service. Book stacks are open to all students.

All periodicals and reference volumes are located on the main floor of the library. The book collection arrangement follows the Dewey Decimal Classification System. Books numbered 000 through 699, as well as the reserve book collection and microfilm and Microcard materials, are located on the ground floor. Books numbered 700 through 999, fiction, the curriculum materials collection, the children's literature collection, Pennsylvania collection, and government documents are located on the top floor.

Graduate students are both encouraged and expected to spend time in the Library. Particular attention is given by librarians to graduate students in procurement of needed materials and the further development of proficiencies. The Library subscribes to the spirit and the letter of the General Interlibrary Loan Code, which regulates the procurement of materials via interlibrary loan.

With the exception of those books which are reserved for special purposes, all books circulate for three weeks. Periodicals do not circulate.

Hours: 7:45 a.m. - 10:30 p.m.—Monday through Thursday
7:45 a.m. - 9:30 p.m.—Friday
7:45 a.m. - 5:00 p.m.—Saturday
2:00 p.m. - 10:30 p.m.—Sunday

Summer and vacation hours are posted at the library entrance.

Library Staff: William E. Lafranchi, Director of Libraries; Ronald A. Steiner, Associate Director of Libraries; Richard Chamberlin, Carol Connell, Carolyn Grundy, Paul R. Hicks, David Kaufman, John Lucas, Lynne Lucas, John Grassinger, Katherine Mallino, Elizabeth S. Parnell, Wanda Rife, Martha Scheeren, Daniel Shively, Marie E. Snead, Dorothy Volm, Edward G. Wolf, James Hooks.

Learning Research Center (*Armstrong Center*)

Housed in the Learning Research Center at Davis Hall are the Laboratory School, a control and production center for both open and closed circuit television, several special clinics, an audio-visual center, and teaching materials center.

The Laboratory School, with an enrollment of 215 students from kindergarten through sixth grade, provides an opportunity for graduate students to observe and to participate in problems relating to teaching.

The Audio-Visual Center provides graduate students with an excellent collection of films, filmstrips, and other audio-visual

equipment. Students may learn how to use audio-visual materials through courses offered in this area.

The Computer Center

In addition to the services provided by the Rhodes R. Stabley Library and the Learning Research Center, computer services are available for graduate research studies. Full-time staff members provide assistance with programming and the distribution of data results.

Placement Service

Placement is a service offered by Indiana University of Pennsylvania to its graduates without charge. The services of the Placement Bureau are available to students who have received their Master's degree or who have been accepted as candidates for the degree in the Indiana Graduate School. Graduate students wishing to take advantage of placement service should complete the necessary forms with the Director of Placement.

FINANCIAL AID

Assistantships

For full-time graduate students, two types of assistantships are available at Indiana: teaching assistantships and graduate student employment.

Teaching assistants are utilized to supplement the instructional efforts of regular staff members by lecturing, instructing lab sections and tutoring. Graduate student workers perform a range of duties among which are: aiding faculty research, supporting the instructional staff, and providing needed student services.

Students interested in such appointments should request application forms from the office of the Associate Dean of the Graduate School not later than March 1. Appointments are made by the chairman or Director of Graduate Studies of the department concerned, with the approval of the Graduate School. The number of appointments and the size of the stipends awarded depend on the approval of budgeting requests and therefore may vary from year to year. Tuition fees are waived for teaching assistants.

Scholarships

The Board of Trustees of the Indiana University of Pennsylvania has authorized the college Loan and Scholarship Committee to award some scholarship aid to meritorious graduate students. The following procedure has been established by the Loan and Scholarship Committee:

1. One \$50.00 scholarship be awarded each semester to that graduate student who best merits the award.

2. Three members of the Graduate Council serve as a committee to recommend the recipient to the Loan and Scholarship Committee.

3. Nominations for the award be made to the committee by the Dean of the Graduate School.

4. To be eligible for nomination the student must have completed twelve semester hours of graduate work at Indiana and be an approved candidate for the Master's degree at Indiana.

Delta Pi Epsilon Graduate Scholarship

This graduate scholarship was established by Beta Alpha Chapter of Delta Pi Epsilon which is a National Honorary Graduate Fraternity in Business Education. The scholarship award of twenty-five dollars is made each year by Beta Alpha Chapter and is awarded to a business education graduate student on the basis of outstanding scholarship and research.

Kappa Delta Pi Graduate Scholarship

The Kappa Delta Pi Graduate Scholarship was established by Beta Gamma Chapter of this university to honor that member of the graduate group who is judged the ideal student. This award of twenty-five dollars is made each year by a committee of the local chapter and is awarded on the basis of scholarship and research competition.

Counselorships for Men

Appointments are available to men graduate students to serve as Hall Counselors and House Heads in undergraduate dormitories on and off campus. Background or training in counseling or personnel work is desirable though not essential. These appointments are made for each semester, and are usually renewable for the second semester at the regular stipend for a hall counselor. Requests for information and applications should be addressed to the Dean of Men. Completed application forms should be submitted to his office by April 1 for openings in the Fall.

Counselorships for Women

Several appointments are available to women graduate students to serve as counselors in residence halls. Counselors receive \$30.00 per month in return for working with undergraduates in the areas of social, academic, and emotional adjustment. Applications should be submitted to the office of the Dean of Women by March 25.

Veterans

Indiana is approved to offer training under the various G.I. Bills (Public Law 550) and Public Law 894 (disabled Korean

veterans). Students who are entitled to training under one of these bills should contact the Veterans' Counselor immediately after being accepted for admission to Indiana in order to secure additional instructions. This procedure is necessary so veterans may be included on the monthly payrolls. The Office of the Veterans' Counselor is in Gordon Hall.

Housing Facilities

Room reservations can be made by writing to the Director of Housing. An advance registration deposit will not be required to reserve a room for summer sessions.

Students are not expected to room alone. Therefore, students are urged to apply in pairs. In this way each student is assured a congenial roommate. Single applications are handled to the best possible advantage, but the university prefers that students make their own choices whenever possible. Applications for rooms are filed in the order in which they are received.

Those in the Indiana Graduate School who desire housing facilities for the summer should write for information and make reservations with the Director of Housing. All housing arrangements should be cared for as early as possible.

The housing fee, which includes room, board, and laundry, is \$18.50 per week for women, \$18.00 for men.

Privately owned graduate student apartments are also available at reasonable rates the year round.

ACADEMIC INFORMATION

Admissions

Admission to the Graduate School is required before any interested person may enroll in any graduate course for graduate credit. The following policy has been established by the Graduate Council:

1. The applicant must present a Bachelor's degree from a college or university that has been accredited by the Middle States Association of Colleges and Secondary Schools or the appropriate regional accrediting agency.
2. The applicant must present a transcript of his undergraduate work showing a 2.6 honor point value for all four years of his undergraduate work. The 2.6 assumes a grade of A to have 4 honor points per credit hour, a grade of B to have 3 honor points per credit hour, and a grade of C to have 2 honor points per credit hour. If the applicant's undergraduate record does not meet this 2.6 honor point value, or if he is a graduate of an unaccredited college, he may be admitted by making a satisfactory score on an entrance qualification examination.
3. If the applicant is in the field of education and interested in certification, he must possess a Provisional Pennsylvania

Teacher's Certificate or its equivalent in the field in which he wishes to do graduate study.

4. A satisfactory recommendation must be obtained from the applicant's undergraduate department or from qualified references.
5. Students applying for the degree in Music Education must present evidence of musical maturity by means of a tape recording of their major area of music performance. This should be mailed to the chairman of the Music Department with a covering letter at the time of application.

Admission to the Graduate School does not automatically mean that the student is a candidate for an advanced degree at Indiana University.

Steps Necessary For Admission To The Graduate School

1. The applicant will file an application for graduate work with the Dean of the Graduate School. Write early to the Dean of the Graduate School for application forms. (Check calendar on pages 4 and 5 for deadline date.)
2. Each applicant will present a transcript of all undergraduate work taken for the Bachelor's degree. Transcripts of previous work taken at Indiana need not be submitted.
3. Each applicant may be required to have a personal interview with the Dean of the Graduate School or an assigned faculty member.
4. No one presently on the staff at Indiana University may be enrolled for a graduate degree.

Graduate Record Examination

The Graduate Record Examinations are administered periodically at the Indiana University of Pennsylvania. These examinations are required or recommended of candidates for admission to many American graduate schools and of applicants for graduate fellowship awards.

While Graduate Record scores are not required for admission to the Graduate School at Indiana, they are required for admission to candidacy in all degree programs. Therefore the examinations should be scheduled early in the degree candidate's work.

A Bulletin of Information with registration form may be obtained from the Graduate Office, Indiana University of Pennsylvania or from The Educational Testing Service, Box 955, Princeton, New Jersey 08540.

Academic Load

Many graduate students depend upon part-time or full-time employment to meet their expenses. A student who is thus employed must recognize the time demands of his work schedule in

planning his graduate program. The Graduate School assumes that its facilities should be made available only to students who can benefit from graduate study to a maximum extent.

It is possible for students to schedule a full-time load in many of the approved programs. Eight to sixteen semester hours of work per semester is regarded a full-time graduate schedule. Full-time students should submit their proposed schedule for approval as early as possible. For part-time students who are teaching, a maximum of four semester hours or two courses may be scheduled each semester. The number of semester hours of work obtained during summer sessions shall not exceed the number of weeks of attendance.

No student may accumulate more than six hours in "tour" courses toward a degree.

Programming and Registration

The responsibility for being properly programmed and registered rests with the student. For each session the student, following the curriculum in this publication under his particular major field, prepares a schedule of courses to fit his individual needs. Normally he schedules content courses in his major as rapidly as they are available. The schedule is submitted to the Dean of the Graduate School for his approval. The student is responsible for following the specified procedure.

Fees

(Subject to change without notice)

Tuition Fee\$36.00 per semester hour for
 Pennsylvania residents.
 \$43.00 per semester hour for
 out-of-state residents or stu-
 dents employed out of state.

Tuition Fee for Music Education Students will be at the same rate for course instruction but private instruction will be charged at the rate of \$50.00 per semester hour.

Graduation Fee\$5.00

Service Fee. The service fee for the regular summer session is \$10.50, and \$3.75 each for the pre- and post-session.

During the academic year, part-time students (seven hours or less) will pay a service fee of \$11.00. Full-time students (eight hours or more) will pay \$30.00.

Late Registration Fee\$1.00 per credit per day will be assessed a student who fails to complete registration, including payment of fees, on the dates and within the hours specified in the published procedure for registration for any particular semester or term.

Master's Cap, Hood and Gown FeeCandidates who have been accepted by the Graduate School for the Master's degree are required to purchase or rent from the college bookstore a Master's cap, hood, and gown to be worn at the graduation exercises. The fee for these items is nominal.

Thesis or Research Project Binding ExpensesThe binding of the required copies of the thesis or the research project is an expense which must be cared for by each graduate candidate. The current charge for binding a thesis is \$5.00 per copy and for binding a research project, \$3.00 per copy. The library copy is required to be hard bound.

Refunds

There will be no tuition refunds except in cases of prolonged illness. A request for such a refund must be accompanied by a medical certificate indicating prolonged illness and inability to work or attend classes. Half of the tuition fee will be refunded if the request is made prior to the completion of one-third of the scheduled class periods. No refund will be made after one-third of the class meetings.

Withdrawals from Classes

If a student decides to withdraw from a course before the middle of any semester or session, he may do so by notifying the Graduate Office in writing of his intent to withdraw. In this case a grade of W may be entered on the permanent record. A student withdrawing from a course after the middle of a semester or session will automatically receive an F. If withdrawal is caused by a health condition or for another approved reason, the grade may be indicated as incomplete and made up in accordance with an agreement between the instructor, student, and Dean of the Graduate School.

Class Cancellation

It is the policy of the Graduate School not to cancel regularly scheduled classes because of weather conditions, nor does the School issue announcements over radio stations or in newspapers or give information through its switchboard that classes will be suspended because of such conditions. In cases of an emergency which disrupts transportation facilities or creates personal problems, students should make decisions as to attendance which appear appropriate to them in their particular circumstances.

Scholarship Requirement

A candidate must have maintained a grade point average of 3.0 (B), in all graduate work. Only grades "A," "B," or "C" are acceptable toward a Master's degree. Marking system: grade of

“A,” 4 quality points; “B,” 3 quality points; “C,” 2 quality points. The work in any course must be completed by the final meeting of the particular class. An incomplete grade will be issued only when the work is interrupted due to a health condition. Under such a condition the “I” grade must be removed within sixty days following the end of the session.

Transfer of Credit

Resident (on main campus) graduate work of high quality done in a recognized graduate school elsewhere and coming within the five-year time limit may be accepted to the extent of 6 semester hours. Such credits will be transferred to the Graduate School at Indiana only after the student has applied for admission to candidacy for the degree, and then only if the chairman of the department concerned, after conference with the student, recommends to the Dean for his approval the transfer of such credits as coordinate with the student's program in his chosen field. Work already applied toward another degree cannot be accepted. The final six hours in any program must be completed at Indiana.

No credit will be granted toward a Master's Degree for work completed in extension courses or in off-campus centers of another institution. Transfer credit will not be accepted for courses in which a grade lower than B or its equivalent has been received. Applications for transfer of credits, which should be filed prior to taking course work elsewhere, are available in the Graduate Office.

Student Responsibility

The graduate student is expected to know the requirements for the degree he plans to earn. While the officers and teachers of the Graduate School will endeavor to aid in any way possible, the responsibility for any error in his own enrollment or in the interpretation of the requirements rests with the student.

Auditors

Students not eligible to enroll for credit may enroll as auditors. Course fees are the same as for those enrolled for credit. Anyone qualified for admission is expected to apply formally for admission before requesting permission to enroll in any graduate class.

The Advisory System

The purpose of the advisory system is to insure that the student's work follows a coherent, well-balanced, and unified program for his professional growth and development. The procedure for the administration of the system varies among the departments and is under the jurisdiction of the department chairman.

Application for Graduation

The student is responsible for submitting a formal written application for graduation and for fulfilling all requirements for the degree in accordance with the calendar in this bulletin.

For August graduation, all course work must be completed by the end of the preceding Main Summer Session. (Formal applications for May graduation are due March 1; for August graduation, June 1; and for January graduation, October 1.)

Transcripts of Graduate Work

Transcripts of one's graduate work may be obtained by contacting the registrar's office. The fee for this service is \$1.00 per transcript.

Permanent Certification Requirements

By action of the State Council of Education, all college certificates issued after October 1, 1959, require the completion of at least twelve hours of post-baccalaureate work for permanent certification. Provisional certificates issued after October 1, 1963, require twenty-four semester hours for permanent certification. Of the twenty-four hours at least twelve must be in the field of certification.

All teachers who are able to qualify for admission to a graduate program and who are able to profit by graduate work should be encouraged to do the work required for Permanent Certification in a Graduate Program in order that it may also be used toward a Master's degree.

For teachers in the public schools, the graduate programs are designed to meet the credit requirements for permanent certification. The programs at Indiana have the program approval status with the Pennsylvania Department of Public Instruction.

REGULATIONS FOR PRINCIPAL'S CERTIFICATES IN PENNSYLVANIA

On October 1, 1964, new regulations for the issuance of principal's certificates became effective. The new regulations for the provisional elementary or secondary principal's certificate are substantially as follows: An applicant shall: (1) Hold a Pennsylvania College Certificate. (2) Have three years of successful experience. (3) Complete 45 semester hours of graduate study, including a Master's degree with the following minimum requirements: (a) 12 semester hours in an academic field other than psychology; (b) graduate study in developmental and remedial reading; (c) 15 semester hours distributed among administrative processes, curriculum and instructional processes, and the history and role of the school in society; and (d) documentary evidence of proficiency in English. The College Certificate and experience must be at the level (elementary or secondary) for which administrative certification is requested.

The Cooperative Administration of the Regulations by Indiana University of Pennsylvania and The Pennsylvania State University

An applicant for a Provisional Elementary or Secondary Principal's certificate must be endorsed by an institution with an approved program in administration. Indiana does not provide a program in administration but has a cooperative arrangement with The Pennsylvania State University whereby a student interested in this certification may secure the endorsement of the approved institution by the following plan:

1. If a candidate for one of these certificates completes graduate work at Indiana for a Master of Education Degree in Elementary Education or in an academic field, he may complete the post master's-work (at least 15 hours) at The Pennsylvania State University.

2. When the student applies for admission to candidacy for the M.Ed. at Indiana, he should indicate his intention to seek principalship certification. The Dean of the Indiana Graduate School will review the candidate's qualifications and may recommend the candidate to The Pennsylvania State University.

3. The Pennsylvania State University decides how much of the graduate work completed at Indiana may be counted towards the 45 hours needed for certification endorsement. Part or all of the minimum 30 hours earned for the M.Ed. at Indiana may be acceptable. The student should plan to schedule reading courses and courses in measurement and statistics as electives in his program at Indiana.

4. The completion of the research requirement at Indiana may be accepted as documentary evidence of proficiency in English.

5. After completion of his graduate program at Indiana, the student should seek admission to the Graduate School of The Pennsylvania State University indicating his interest in principalship certification. For application forms and information write to: The Assistant Dean for Admissions, The Graduate School, The Pennsylvania State University, University Park, Pennsylvania.

6. The provisional certificate based on the 45 hours is valid for serving as a Principal for five years. To make this provisional certificate permanent, 15 additional approved graduate hours are required and may be completed at The Pennsylvania State University or other institutions with an approved administration program.

THE MASTER'S DEGREE

The Graduate School at Indiana offers work leading to the degree Master of Education in the following fields:

Art	Mathematics
Biology	Music
Business	Physics
Chemistry	Reading
Counseling and Guidance	Science
Elementary Education	Social Science
Elementary Science	Spanish
English	Special Education
Geography	Speech & Hearing
Home Economics	

The Master of Arts degree is conferred in:

Counseling Services	History
English	Music
Geography	Psychology
Social Sciences	

The Master of Science degree is conferred in:

Biology	Geography
Chemistry	Mathematics
Physics	

Admission to Candidacy for a Master's Degree

The student must complete the following steps to qualify for admission to candidacy:

1. Submit an official application for admission to candidacy.
2. Submit a transcript of graduate work completed at other institutions.
3. Complete at least six semester hours of graduate work at Indiana.
4. Receive satisfactory course evaluation from student's graduate instructors.

5. Submit satisfactory scores in the Graduate Record Examination (aptitude and advanced tests).
6. Submit a tentative program of study for the completion of the graduate program.

The application for admission to candidacy, the transcript of the graduate record, and the tentative program of study should be submitted by the student to the Dean of the Graduate School. Acceptance to candidacy requires the approval of the Chairman of the major department and the Dean of the Graduate School.

Semester Hours Required for a Master's Degree

A minimum of thirty semester hours of approved graduate work beyond a Bachelor's degree is required. A well balanced, unified and complete program of study will be required regardless of the minimum credit requirement. Many students may find it necessary to earn more than the minimum number of credits before they will be regarded ready for the degree. Indiana University of Pennsylvania is not committed to grant a degree upon the completion of thirty credits.

Time Limit

Thirty semester hours must be completed within the five-year period immediately preceding the date when all the requirements for the degree are completed. Any work accepted by transfer must also fall within this period. For justifiable reasons the Graduate Council may extend the period.

Residence

A minimum of ten semester hours will be required to be taken during summer sessions. The ten hours need not be taken in any one summer but may be extended over two or more different summers. During summer study, it is assumed that the student is not employed or engaged in any other work, and that his graduate study has top priority in his schedule. A minimum of twenty-four hours must be completed on the Indiana campus either in summer or in part time or full time study during the academic year.

THE RESEARCH REQUIREMENT

Candidates for the M.A., M.S., or M.Ed. degree must satisfy the research requirement as established by the Graduate Council and designed by the departments of the various graduate fields. This requirement is essentially that every candidate must conduct some independent study related to his major field and report on this study with a written thesis or research project, a recital, or another approved method. The degree sought, the ability and record of the candidate, and the nature of the proposed research

are factors in determining how each candidate will be advised to satisfy this requirement.

Purposes of the Research Requirement

The initiation, conduct, and description of a research study results in professional growth usually not attained in other ways. The completed requirement certifies that the student is competent to identify a research topic and to pursue research in his field. An acceptable research report should show evidence that the student:

1. Has comprehended the essentials of his problem, has followed a well-organized plan of work, and has presented satisfactory solutions.
2. Has made a comprehensive study of the related literature.
3. Has made an independent and intensive study of the problem.
4. Has a practical working knowledge of research procedures.
5. Has shown the ability to write in a professional style.
6. Has reached conclusions justified by the findings.
7. Has produced a report of value to the subject field or to professional education.

Distinction Between a Thesis and a Research Project

The study may be in a subject field or in professional education. A thesis will carry from two to four hours of graduate credit as determined by the chairman of the thesis committee and the Dean of the Graduate School. The Dean of the Graduate School will apply the thesis credit to the student's program in the Subject Matter Concentration Area or in the area of Professional Studies depending on the nature of the topic selected. The research project does not carry graduate credit and, unlike the thesis or recital, may not be counted as part of the thirty semester hours required for the degree.

The basic distinction between a research project and a thesis is as follows: the project must make a contribution to the student by helping him to improve his teaching or other educational activity; the thesis, in addition, should contribute new knowledge to the field of study.

The project need not represent original research and may consist of adapting other findings to the student's local situation or of repeating other investigations in different circumstances. The thesis, however, should make a contribution to the student's field of inquiry—a far more rigorous condition than that established for the project.

Minor distinctions may be made with regard to the extent or scope of the study and the level of research competence needed to accomplish the study, but these are distinctions subordinate to the basic one given above. Deciding if a particular activity is of a thesis or project nature is primarily the responsibility of the

student's adviser who must determine if the study will truly contribute to the field or if it will adapt available data to a new situation.

Steps in Satisfying the Research Requirement by Submitting a Research Project

1. The student schedules the course or courses designated by his major field department as designed to assist him in developing the necessary research techniques. Since many projects require considerable time for completion, it is desirable to schedule this work early in the graduate program.
2. The student selects an area of interest in which to do his research.
3. The student gathers from his own experience and from a perusal of completed research some specific topics within his area of interest that might satisfy the research requirement.
4. The student discusses these tentative research plans with the Chairman of his major field department.
5. The student, with the guidance and approval of the Chairman, selects a graduate faculty member who is qualified in the area of the research to act as his adviser. The student secures the agreement of the designated faculty member.
6. The student, with the guidance of his adviser, outlines the nature and scope of a specific research topic.
7. The student develops his topic outlined into a formal research proposal. (A suggested proposal outline is available in the Research Office, Room 204, Clark Hall.) The adviser approves the research proposal before it is typed in multiple copies.
8. The student types three copies of his research proposal (one for himself, one for his adviser, and one for the Director of Research) and submits the latter two to his adviser together with the Research Approval Form (available in the Appendix of this bulletin).
9. The adviser signs Section II of the Research Approval Form and sends it, together with one copy of the research proposal, to the Director of Research.
10. The Director of Research reads the research proposal. He signs Section III of the Research Approval Form and sends it together with the research proposal to the Dean of the Graduate School. If the Director of Research desires certain minor changes in the proposal these are forwarded to the adviser. If major revisions are necessary, the research proposal is returned to the adviser.
11. The Dean of the Graduate School, on receiving the student's research proposal and the Research Approval Form signed in Sections II and III, notifies the student by letter that his research proposal has been approved and if successfully completed will satisfy the Graduate School's research require-

ment. In most cases the approval of the research proposal expires after one year.

NOTE: The student must complete the first eleven steps before applying for graduation.

12. The Director of Research files the research proposal in the student's folder in the Graduate School Office.
13. The student conducts his research. The adviser is frequently given progress reports. Changes in the approved research proposal are permitted provided they have been discussed with the adviser, and the Director of Research has been notified in writing.
14. The student submits the first rough draft of his research project to his adviser. The main emphasis in this draft is organization, sufficiency of data, and accuracy of analysis.
15. After the adviser reads the first draft, a conference is held to discuss any necessary revisions.
16. The student prepares the final rough draft. This draft meets the style and format requirements outlined in W. G. Campbell's *Form and Style in Thesis Writing* (available in the student bookstore). It should be free from errors in spelling, punctuation, grammar, and paragraphing.
17. The student submits the final rough draft of his research project to his adviser. The adviser reads this draft to insure that the suggestions made during the conference on the first draft have been included. He also checks the general format and style.
18. The final rough draft is sent by the adviser to the Director of Research.

NOTE: The deadline date for the final draft to be in the Research Office is December 1 for January graduation; April 1 for May graduation; and July 1 for August graduation. Only minor corrections are permitted after the deadline date, and in the event that a major revision is called for, the student is removed from the graduation list. Notification of this removal is by letter from the Director of Research.

19. The final rough draft is returned to the adviser by the Director of Research with instructions for typing the final copies and required abstracts.
20. The finished typed copies (three for the University and any additional copies desired by the student) and the required abstracts are submitted to the Director of Research.

NOTE: These finished copies and required abstracts must be in the Research Office at least one week before the commencement date. The student should secure necessary signatures before turning the final typed copies into the office of the Associate Dean of Research.

21. The Director of Research sees that the copies are bound and distributed. The three University copies are filed in the library, in the department office, and in the Research Office.
22. The abstract of the research project is printed in the annual Research Bulletin.

Steps in Satisfying the Research Requirement by Submitting a Thesis

The procedure for satisfying the research requirement by submitting a thesis is the same as for the research project with the following "step" substitutions:

6. The student, with the guidance of his adviser, outlines the nature and scope of a specific research topic. The adviser determines whether or not the proposed research will contribute new knowledge to the field of study and thus qualify as a thesis. The adviser and the chairman of the major department select a thesis committee. This committee normally consists of the adviser, who acts as chairman; the chairman of the major department; the Director of Research; and at least one other faculty member.
8. In addition to his own copy, the student prepares one copy of his proposal for each member of his committee and submits them, together with the Research Approval Form (available in the Appendix of this bulletin) to his adviser. The adviser distributes them to the committee members and at the same time arranges for a thesis committee meeting on a date no less than one week hence. The adviser informs the secretary of the Research Office of this date and she sends out official notices, indicating the time and the location of the meeting, to the student and to each member of the Committee.
9. The thesis committee meets at the designated time and place to discuss the nature of the proposed research and the method to be used in developing the topic. The members of the committee sign Section IV of the Research Approval Form. Any minor revisions in the proposal made by the committee are observed by the student as he prepares his rough draft. Should the committee suggest major changes, the proposal is resubmitted to the committee before Section IV of the Research Approval Form is signed. (This necessitates the formal calling of another thesis committee meeting.)
10. The Director of Research sends the signed Research Approval Form and his copy of the thesis proposal to the Dean of the Graduate School.
11. Substitute "Sections II and IV" for "Sections II and III."
17. The student prepares one copy of his final rough draft for each member of the committee and submits them to his adviser. The adviser distributes them to the committee members and at the same time arranges for a thesis committee meeting

on a date no less than one week hence. The adviser informs the secretary of the Research Office of this date and she sends out official notices, indicating time and location of the meeting, to the student and each of the committee members.

18. The thesis committee meets at the designated time and place. The student briefly outlines the significant findings of his research and then answers questions put to him by committee members concerning the content, organization, and conclusions of his study. The members of the committee sign Section V of the Research Approval Form. The chairman of the committee determines the grade to be received for the thesis and records it on the Research Approval Form at the time he signs.

NOTE: The deadline date for the thesis committee meeting to approve the final rough draft is December 1 for January graduation; April 1 for May graduation; and July 1 for August graduation. If this meeting is not held by the deadline date the student is removed from the graduation list. Notification of this removal is by letter from the Director of Research.

STUDENTS PLANNING TO GRADUATE IN AUGUST MUST REMEMBER THAT MANY FACULTY MEMBERS ARE NOT ON CAMPUS DURING THE SUMMER. THEREFORE, DATES FOR THESIS COMMITTEE MEETINGS SHOULD BE WELL IN ADVANCE TO INSURE THAT THE FACULTY MEMBERS WILL BE AVAILABLE.

19. At the time of approval, the Director of Research gives the student instructions for typing the final copies and required abstracts.
22. The abstract of the thesis is printed in the annual **Research Bulletin**.

Steps in Satisfying the Research Requirement by Giving a Recital

Students planning to satisfy the research requirement by giving a recital work under the direction of the chairman of the music department and an applied teacher. The outlined procedure for the Graduate Recital is available in the Music Department office. Jury approval of the student audition (Step 2 of "Suggested Procedure for the Graduate Recital") must be obtained by December 1 for January graduation; April 1 for May graduation; and July 1 for August graduation. The student is also responsible for preparing a report of his recital for the Director of Research (Step 5 of "Suggested Procedure for the Graduate Recital"). A booklet describing the form and style of this report is available in the Research Office. The recital program is printed in the annual **Research Bulletin**.

Other Methods of Satisfying the Research Requirement

Other accepted forms of research, as approved on an individual basis or as a policy of a particular degree or department, must be completed by December 1 for January graduation; April 1 for May graduation; and July 1 for August graduation.

Exceptions to Policy

The methods for satisfying the research requirement as described above are those established by the Graduate Council and implemented by the Dean of the Graduate School. Any exceptions to these procedures must have prior approval of the Dean of the Graduate School.

Duplicate copies of the research proposal and drafts of a thesis or project should be retained by the student. The Graduate School cannot accept responsibility for the loss of such materials.

ADVANCED GRADUATE STUDY BEYOND MASTER'S DEGREE

Students may find that more courses are offered that would be of benefit to them than they are able to include in their Master's degree program. These students are encouraged to continue their training after receiving their Master's degree and this additional training will be recognized by many school districts for salary purposes and by the Bureau of Teacher Certification for certification purposes. Students are advised, however, that most graduate schools have their own residence requirements and will probably not accept more than 30 credit hours (or Master's equivalent) of graduate credit earned at Indiana toward the Doctor's degree at their institution.

Appropriate certificates may be awarded to the student who completes an additional 15 or 30 credit hours beyond the Master's degree. For purposes of this certificate these credits must be apportioned in a manner approved by the Dean of the Graduate School.

Eligibility of Teaching Staff

Members of the faculty of Indiana University of Pennsylvania with a rank of Assistant Professor or above (or equivalent), may not receive a graduate degree from this institution. This regulation applies also to any faculty member employed by this institution full-time at the instructor rank unless such an individual is already an approved candidate for a degree in the Graduate School of I. U. P. at the time he is given full-time employment as an instructor. Faculty members may, however, register for work in the Graduate School and apply the credit toward graduate degrees to be conferred by other institutions.

THE DOCTOR'S DEGREE

The Graduate School offers a program leading to the Doctor of Education degree in Elementary Education and a program leading to the Ph.D. degree in English and American Literature.

THE DEGREE OF DOCTOR OF EDUCATION

The Doctor of Education degree is a professional degree designed primarily for those who desire to continue advanced study toward becoming superior teachers or teacher educators or teacher supervisors.

This degree is conferred for distinguished achievements in a specialized area of education, for demonstrated ability in independent research, and in recognition of a significant contribution to education as evidenced by the dissertation. The degree is not awarded until the candidate has demonstrated a comprehensive understanding of the foundations of education and proficiency in applying this understanding to his field of specialization.

Each department offering the degree has beyond the general requirements of the Graduate School its own special requirements to be met and may, but only with the approval of the Graduate Council, waive or modify any of the general requirements. The department's detailed description of the degree should be consulted.

General Requirements

A minimum of three academic years of study beyond the Bachelor's degree, or the equivalent, or two years beyond the Master's degree, must be devoted to the doctoral program.

After the student has been declared a candidate for the degree a maximum of five years is allowed for the completion of work.

A minimum of seventy-eight semester hours of credit, exclusive of research credits, must be earned beyond the Bachelor's degree.

Candidates for the doctor's degree are expected to enroll as full-time resident students and must serve a residency of at least two consecutive semesters.

Transfer credit is limited to the credit-equivalent of a Master's degree, except in special cases approved by the appropriate department chairman and the Dean of the Graduate School.

Admission to Candidacy

A student may be declared a candidate for the Doctor of Education degree only after he has met the following requirements:

- (1) completed at least twelve semester hours of credit beyond the Master's degree with at least a B average.
- (2) filed with the Dean of the Graduate School evidence of at least two years of satisfactory teaching experience, or its equivalent as established by the major department.

- (3) performed satisfactorily in the candidacy examination administered by the major department.
- (4) filed with the Dean of the Graduate School acceptable scores in the Graduate Record Examination, including the special examination in education.
- (5) filed with the Dean of the Graduate School a program of study approved by the major department.

A student must be accepted as a candidate before he has completed thirty hours of credit beyond the Master's degree. In Elementary Education the student must have the approval of the department to go beyond forty-five hours of graduate work.

The Advisory Committee

The candidate's advisory committee is normally composed of five persons: the chairman of his major department and four additional members of the faculty of the University, including the research adviser, who functions as chairman. The department chairman appoints the committee at a time between the student's candidacy examination and the comprehensive examination. Ex officio members of the committee are the Dean of Graduate School, or his representative, and the Director of Graduate Research at the University. The committee administers the comprehensive examination, supervises the candidate's research activity, and evaluates the **dissertation**.

The Candidacy Examination

The candidacy examination, which may be written, or oral, or both, and which may serve also as the final examination for the Master of Education degree (where a department requires such an examination), is administered by the department of the student's principal subject in his area or areas of specialization. This examination may not be taken until the student has completed at least one year of study beyond the Bachelor's degree. Scores on the examination must satisfy the student's advisory committee.

The Comprehensive Examination

The comprehensive examination is given to determine whether the student has made satisfactory progress in his study, and to determine the likelihood that he will pursue research for his thesis profitably and meet training requirements for the degree. The examination is in four parts: History and Philosophy of Education; Psychology and Sociology of Education; Measurement, Evaluation and Statistics; the candidate's major field of study.

This examination is both written and oral and is administered by the advisory committee after the student has completed forty-five hours of work beyond the Bachelor's degree and before he

has completed sixty. The examination is scheduled three times a year, in November, March and July.

The Plan of Study

Preparation for the degree of Doctor of Education is based on (1) the study of the history and philosophy of education, the psychology and sociology of education, and measurement, evaluation and statistics; (2) a concentration or major in counseling and guidance, educational administration, educational psychology, elementary education, or special education; (3) a minor field of study (usually but not necessarily from a department other than education).

The program of study must be planned in consultation with the department of major study and must be approved by the Dean of the Graduate School. The student should plan his course of study with his department so as to meet both departmental and general Graduate School requirements. The plan of study should designate (1) major field and minor area or areas of concentration, (2) courses to be taken, including a sequence in statistics and computer language, (3) the general field of research, (4) the names of members of the advisory committee, and (5) the subject (tentative) of the dissertation.

The plan of study must be filed with the Dean of the Graduate School as a part of the student's petition for candidacy.

Educational Administration

Indiana does not offer the Doctor of Education degree in Educational Administration, but does provide for those interested in such a degree, or in the principal's certificate, through a cooperative arrangement with the Pennsylvania State University. For an account of this arrangement see above, p. 25.

Statistics and Computer Language

For the Doctor of Education degree the candidate must pass a sequence of courses in statistics as prescribed by the major department. He must also demonstrate by examination, or through evidence of training satisfactory to the major department, a competence in computer language.

These requirements may be met after the time of admission to candidacy, but necessary training in statistics and computer language should be scheduled early in the candidate's program.

Review of Research Proposal

After the candidate has passed the comprehensive examination and after he has done extensive preliminary research, he must appear before his advisory committee to defend his research proposal. A copy of this proposal, prepared according to directions supplied by the Director of Graduate Research must be in the

hands of each committee member at least two weeks in advance of the meeting. The proposal must be found satisfactory by all members of the committee before the candidate may proceed with the dissertation.

The Dissertation

A dissertation is required of all candidates for the Doctor of Education degree. The thesis must demonstrate the candidate's mastery of the area of his research. It must embody the results of an original investigation in his principal field of study. It must give evidence of an exhaustive study of a specialized field and must provide an authoritative statement of knowledge on the subject or produce a new interpretation by rearrangement or re-analysis of existing data. The work must provide a definite contribution to knowledge of sufficient importance to warrant its publication. The student must schedule at least three credits in research each of his last two semesters. There is no maximum on the number of credits he may receive for his dissertation. He may schedule in research up to three credits a semester from the time at which the dissertation subject is approved by the advisory committee.

Dissertation Review Meeting

After the doctoral thesis has been accepted by the candidate's research adviser, a finished copy is presented to the Dean of the Graduate School, from whom it circulates to all members of the advisory committee. At a time convenient to all, the candidate shall then request a formal meeting of the advisory committee in order to secure approval of the dissertation. The dissertation must be approved by each member of the advisory committee.

Publication of the Dissertation

After the dissertation has been approved and accepted by the major department and by the advisory committee, two copies of the dissertation and two copies of an abstract must be submitted to the Graduate Council through the office of the Dean of the Graduate School. The major department may require a third copy for the department archives. Instructions on the final form of the dissertation are available at the office of the Director of Graduate Research.

The dissertation must be microfilmed according to the plan provided by University Microfilms, Ann Arbor, Michigan, as outlined under the Ph.D. requirements (see page 53).

Re-examination

A student who fails the candidacy examination, or any part of the comprehensive examination, or any of the examinations in statistics or computer language, may present himself for re-exam-

ination not earlier than one semester later nor later than one year after the time of the first examination. No student will be allowed a third examination without a recommendation to that effect from the department in which he has done his major work and the approval of the Graduate Council.

Application for Graduation

Formal application for graduation must be filed with the Dean of the Graduate School not later than two months prior to the date of the University Convocation at which the candidate expects to receive the Doctor's degree.

THE DEGREE OF DOCTOR OF PHILOSOPHY

The Doctor of Philosophy degree is conferred for distinguished achievement in some particular field of scholarship and for demonstrated ability for independent research in a subdivision of this field. No specific number of course credits entitles a student to the degree.

Each department offering the degree has beyond the general requirements of the Graduate School its own special requirements to be met, and may, but only with the approval of the Graduate Council, waive or modify any of the general requirements. The department's detailed description of the degree should be consulted.

General Requirements

A minimum of three academic years of study beyond the Bachelor's degree, or the equivalent, or two years beyond the Master's degree, must be devoted to the doctoral program.

After the student has been declared a candidate for the degree a maximum of five years is allowed for the completion of work.

A minimum of sixty semester hours of credit, exclusive of research credits, must be earned beyond the Bachelor's degree.

Beyond the Bachelor's degree one academic year of full-time enrollment on the Indiana University campus is required to fulfill residence. This requirement may be satisfied by enrolling for two semesters or for one semester and a summer.

Transfer credit is limited to the credit-equivalent of a Master's degree, except in special cases approved by the appropriate department chairman and the Dean of the Graduate School.

Admission to Candidacy

A student may be declared a candidate for the Doctor of Philosophy degree only after he has met the following requirements:

(1) completed at least twelve semester hours of credit beyond the Master's degree with at least a B average.

(2) performed satisfactorily in the candidacy examination administered by the major department.

(3) filed with the Dean of the Graduate School acceptable scores in the Graduate Record Examination, including the special examination in the candidate's field.

(4) filed with the Dean of the Graduate School a program of study approved by the major department.

A student must be accepted as a candidate before he has completed twenty-four hours of credit beyond the Master's degree.

The Advisory Committee

The candidate's advisory committee is composed of five persons: the chairman of his major department and four additional members of the faculty of the University, including the research adviser, who functions as chairman. The department chairman appoints the committee at a time between the student's candidacy examination and the comprehensive examination. Ex officio members of the committee are the Dean of the Graduate School, or his representative, and the Director of Graduate Research at the University. The committee administers the comprehensive examination, supervises the candidate's research activity, and evaluates the dissertation.

The Candidacy Examination

The candidacy examination, which may be written or oral, or both, and which may serve also as the final examination for the Master's degree (where a department requires such an examination), is administered by the department of the student's principal subject. This examination may not be taken until the student has completed at least one year of study beyond the Bachelor's degree. Scores on the examination must satisfy the student's advisory committee.

The Comprehensive Examination

The comprehensive examination is given to determine whether the student has made satisfactory progress in his study, and to determine the likelihood that he will pursue research for his thesis profitably and meet training requirements for the degree. It may be both written and oral and is designed by the candidates committee to test the student's knowledge in his major field of specialization and supporting fields. It is not necessarily confined to the areas in which the student has taken course work at Indiana or elsewhere.

This examination may not be taken until the student has completed at least one and one-half years of study beyond the Bachelor's degree.

The Plan of Study

Preparation for the degree of Doctor of Philosophy is based on the study of a major subject, to which one or more minors may be added. The program of study must be planned in consultation with the department of major study and must be approved by the Dean of the Graduate School. The student should plan his course of study with his department so as to meet both departmental and general Graduate School requirements. The plan of study should designate (1) major field and minor areas of concentration, (2) courses to be taken, (3) foreign languages in which reading proficiency is to be attained, (4) the general field of research, (5) the names of members of the advisory committee, and (6) the subject (tentative) of the dissertation.

The plan of study must be filed with the Dean of the Graduate School as a part of the student's petition for admission to candidacy.

Foreign Language Requirements

The candidate for the Doctor of Philosophy degree is required to demonstrate a competent reading knowledge of two foreign languages appropriate to the general area of study or (upon recommendation of his advisory committee) a reading knowledge of one foreign language together with a comprehensive knowledge of its literature. In the first case the requirements for either or both of the languages may be met by passing a third-year college course in a foreign language, with a minimum grade of C, within five years (or less, at the discretion of the department) of admission to the Graduate School. In the second case the passing of at least two graduate courses in a foreign literature, conducted in the language of that literature, is required. Otherwise the requirement of competence in an approved language must be met by passing an examination proving the student's ability to read in that language in his general area of study.

Language examinations are given four times a year at times and places designated in the current calendar of the Graduate School. Students who desire to be scheduled must file applications at least five weeks in advance of the examination date.

Examinations in French, German, Russian, and Spanish are administered by the Educational Testing Service. The fee is \$7.00. All other language examinations are administered by the Foreign Language Department of the University. For these there is no fee.

The student should acquire proficiency in the foreign language early in his graduate career and well before he starts reading for the comprehensive examination, but he should not present himself for examination until he feels confident of passing.

Review of Research Proposal

After the candidate has passed the comprehensive examination and after he has done extensive preliminary research, he must

appear before his advisory committee to defend his research proposal. A copy of this proposal, prepared according to directions supplied by the Director of Graduate Research, must be in the hands of each committee member at least two weeks in advance of the meeting. The proposal must be found satisfactory by all members of the committee before the candidate may proceed with the dissertation.

The Dissertation

A dissertation is required of all candidates. The thesis must demonstrate the candidate's mastery of the area of his research. It must embody the results of an original investigation in his principal field of study. It must give evidence of an exhaustive study of a specialized field and must provide an authoritative statement of knowledge on the subject or produce a new interpretation by rearrangement or reanalysis of existing data. The work must provide a definite contribution to knowledge of sufficient importance to warrant its publication.

The student must schedule at least three credits in research each of his last two semesters. There is no maximum on the number of credits he may receive for his dissertation. He may schedule in research up to three credits a semester from the time at which the dissertation subject is approved by the advisory committee.

Dissertation Review Meeting

After the doctoral thesis has been accepted by the candidate's research advisor, a finished copy is presented to the Dean of the Graduate School, from whom it circulates to all members of the advisory committee. At a time convenient to all, the candidate shall then request a formal meeting of the advisory committee in order to secure approval of the dissertation. The dissertation must be approved by each member of the advisory committee.

Publication of the Dissertation

After the dissertation has been approved and accepted by the major department and by the advisory committee, two copies of the dissertation and two copies of an abstract must be submitted to the Graduate Council through the office of the Dean of the Graduate School. The major department may require a third copy for the department archives. Instructions on the final form of the dissertation are available at the office of the Director of Graduate Research.

The dissertation is published by University Microfilms, Ann Arbor, Michigan, and a fee of \$25.00 is charged to cover this expense. Upon certification by the student's committee and the Dean of the Graduate School, the typed first copy and an abstract not exceeding 600 words are forwarded to University Microfilms. (This abstract is in addition to the two copies of the abstract required for binding with the dissertation and must be carefully

prepared for microfilming according to specification set forth by the Director of Research). The manuscript is microfilmed, and the negative inspected and placed in vault storage. The manuscript is catalogued and this information is sent to the Library of Congress for printing and distribution of cards to depository catalogues and libraries. The abstract is printed in the forthcoming issue of Doctoral Abstracts and distributed to leading libraries in this country and abroad, and to a selected list of journals and abstracting services. The first copy with one positive microfilm is then returned to the Rhodes R. Stabley Library on the University campus.

Re-examination

A student who fails the candidacy examination, or the comprehensive examination, or any of the language examinations, may present himself for re-examination not earlier than one semester later nor later than one year after the time of the first examination. No student will be allowed a third examination without a recommendation to that effect from the department in which he has done his major work and the approval of the Graduate Council.

Application for Graduation

Formal application for graduation must be filed with the Dean of the Graduate School not later than two months prior to the date of the University Convocation at which the candidate expects to receive the Doctor's degree.

DEPARTMENT CURRICULUMS, INSTRUCTIONS AND COURSE DESCRIPTIONS

ART

Lawrence F. McVitty, Chairman

Robert C. Seelhorst, Director of Graduate Studies

Barbara J. Balsiger	George B. Johnson
Vaughn H. Clay, Jr.	Joanne P. Lovette
Robert J. Cronauer	Frank Ross
Thomas J. Dongilla	Jean J. Slenker
John J. Dropcho	Robert E. Slenker
James M. Innes	Robert J. Vislosky

The graduate program directed toward a Master of Education Degree in Art assumes that the student has reached a point of desire to increase his abilities in his chosen field. The curriculum makes it possible for students to select a balanced program of professional studies combined with fine and applied arts and crafts. The student should analyze the requirements for the degree in connection with his own needs, selecting courses which will assist in making him a stronger person in his chosen profession. The student will select his advisor for his research area.

Students entering this program must have completed the undergraduate requirements for certification to teach art.

Advisory: Each student will plan his program with his program adviser, appointed upon the student's admittance to Graduate study.

Research: All proposals designed to meet the research requirements in the Art Department must have the approval of at least three members of the art faculty (usually the Art Department Graduate Committee and its Chairman). The research is then carried on by the student with a research adviser, who does not need to be his program adviser.

ART

Curriculum for Master of Education Degree

Students working for this degree with a major in Art will complete the thirty (30) semester hours of work using the following outlines as a guide:

- I. General Studies—Select four to six (4-6) semester hours from at least 2 areas. Other choices may be made with the approval of the adviser.
- | | | | |
|------|-----|--|--------|
| Bus | 570 | Economic Backgrounds of Business | 2 s.h. |
| Eng | 521 | Modern European Fiction | 2 s.h. |
| Eng | 523 | The Development of Modern English | 2 s.h. |
| Eng | 531 | A or B Major Writers | 2 s.h. |
| Eng | 535 | Criticism | 2 s.h. |
| Eng | 536 | Studies in Middle English and Renaissance Literature | 2 s.h. |
| Eng | 537 | Modern American Fiction | 2 s.h. |
| Eng | 540 | Twentieth Century American Drama | 2 s.h. |
| FL | 521 | Language and Society | 2 s.h. |
| Math | 521 | Basic Concepts in Mathematics | 2 s.h. |
| Mus | 521 | Music Literature and Materials | 2 s.h. |
| Phil | 581 | Problems of Logic | 2 s.h. |
| Phil | 582 | Problems of Ethics | 2 s.h. |
| Phil | 583 | American Philosophic Thought | 2 s.h. |
| SS | 521 | Contemporary American Issues | 2 s.h. |
| SS | 561 | Social Policy Studies | 2 s.h. |

II. Subject Matter Concentration Area (14 to 22 s.h.)

A. Professional Studies (4 to 12 s.h.)

1. At least eight (8) semester hours in this section required for students seeking a Supervisor of Art certificate; otherwise, elect four (4) semester hours.

Art	510	Art and the Exceptional Child	2 s.h.
Art	511	Curriculum Development, Supervision, and Administration in Art	2 s.h.
Art	513	Research and Philosophy in Art Education (Prerequisite: Ed 515)	2 s.h.
Grad	550	Thesis	2-4 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.

B. Fine and Applied Arts and Crafts (6 to 18 s.h.)

1. The Basis of Art in Culture (Elect 2 or more s.h.)

Art	522	Art in America	2 s.h.
Art	523	Seminar in Art Criticism	2 s.h.
Art	524	Art of the East	2 s.h.
Art	525	Architectural Influences in Contemporary Society	2 s.h.
Art	526	Exotic Art and Art of Latin America	2 s.h.
Art	527	Renaissance Art	2 s.h.
Art	528	World Art Since 1875	2 s.h.

2. Design (Elect 2 or more s.h.). Three clock hours are required to earn two semester hours. The student may elect three different courses in one field as indicated by Roman Numerals—for example, Graduate Studio in Ceramics I, II and III. (Not in the same session.) See Art 516.

Art	540-541-542	Graduate Studio in Ceramics I, II, III	2-6 s.h.
Art	543	Exhibition Techniques	2 s.h.
Art	544-545-546	Graduate Studio in Fabrics I, II, III	2-6 s.h.
Art	547-548-549	Graduate Studio in Jewelry and Metal Work I, II, III	2-6 s.h.
Art	550-551-552	Graduate Studio in Sculpture I, II, III	2-6 s.h.
Art	553-554-555	Graduate Studio in Crafts I, II, III	2-6 s.h.
Art	556	Graduate Studio in Theater Arts or Dramatic Arts	2 s.h.

3. Graphic Design (Elect 2 or more s.h.) Three clock hours are required to earn two semester hours. The student may elect three different courses or three courses in one field as indicated by Roman Numerals.

Art	561	Graduate Studio in Drawing	2 s.h.
Art	562-563-564	Graduate Studio in Oil Painting I, II, III	2-6 s.h.
Art	565-566-567	Graduate Studio in Water Color Painting I, II, III	2-6 s.h.
Art	568-569-570	Graduate Studio in Print Making I, II, III	2-6 s.h.
Art	571	Graduate Studio in Mural Painting	2 s.h.

4. Directed Studies

Art	516	Directed Studies	2-4 s.h.
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III. Foundations of Education—select two (2) semester hours

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Research Techniques—two (2) semester hours are required. This course should be completed early in the student's program.

Grad	515	Elements of Research	2 s.h.
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Course Descriptions

- Art 510 Art and the Exceptional Child** 2 s.h.
Recent trends in education have required more specific understanding of particular students. This course is designed to consider the characteristics and needs of the mentally retarded and the intellectually gifted child with particular emphasis on the art aspects of their education. (Vislosky, R. Slenker)
- Art 511 Curriculum Development, Supervision, and Administration in Art Education** 2 s.h.
This course offers a study of the organization, direction and supervision of programs of art education in grades 1-12, with emphasis placed on the administrative aspect. Curriculum development, scheduling, the selection, evaluation and requisitioning of art materials, guidance of art and classroom teachers (in-service training), multi-sensory materials, personnel selection, public relations and physical facilities are typical problems. (Lovette, Cronauer, McVitty)
- Art 513 Research and Philosophy in Art Education** 2 s.h.
(Prerequisite: Grad 515)
This course will be required of all Art Education Majors. It will consider the history and philosophy of art education in Europe and America in order to shape concepts of the art program of the future. Opportunity will also be provided to review research related to the foregoing so that the student may define his own research problem or thesis. The prerequisite for this course, Grad 515, is to be scheduled within the first four to eight hours of graduate credit. Art 513 must be taken as soon thereafter as possible but within the first twelve hours of graduate credit. (McVitty, Seelhorst, Vislosky)
- Art 516 Directed Studies** 2-4 s.h.
This course is offered in instances where a particular course is needed by a student, but is not on the regular schedule rotation. Approval must be secured from the adviser, the instructor involved, and the Graduate Committee in Art Education.
- Art 521 Contemporary Movements in Art** 2 s.h.
Current philosophies and trends in fine arts and art education as they apply to human growth and development will be studied. Research and round table discussion of contemporary art forms will help the student to discover the concepts involved in art expression and how they evolved. (Non-Art Majors) (McVitty)
- Art 522 Art In America** 2 s.h.
This course surveys American art and its relation to the development of American ideas and ideals. (Seelhorst, Balsiger)
- Art 523 Seminar in Art Criticism** 2 s.h.
This course explores the various philosophic theories of art and art products. An attempt will be made not only to relate these theories to the senses and form itself, but also to technical, psychological, and cultural values. The primary concepts explored are play, illusion, imitation, beauty, emotional expression, imagination, empathy, creativity, and experience. Some time will be given to forms of art that are not primarily visual, including music, dance, literature and poetry. (Seelhorst)
- Art 524 Art of the East** 2 s.h.
The aspects of Eastern Art will be studied as to the nature of their origin, meaning, and place in contemporary world culture. (Clay)
- Art 525 Architectural Influences in a Contemporary Society** 2 s.h.
Architecture is studied in its relation to the needs of contemporary life. Experimental problems in structure and aesthetics as related to architecture are explored. Attempts are made to search out the historical roots of many contemporary styles of architecture. (Seelhorst, R. Slenker)

Art 526 Exotic Art and Art in Latin America 2 s.h.

Not all cultures are of Graeco-Roman heritage. This course will be designed around the art of other cultures, sometimes called primitive, in order that we may recognize the nature of the artistic contribution of these peoples. (Clay)

Art 527 Renaissance Art 2 s.h.

This is the study of the great art achievements of the Renaissance in the fields of painting, architecture, sculpture, and the minor arts. Achievements in the humanities and their relationships are studied against the background of the social, economic and political developments of the era. (Balsiger, Innes)

Art 528 World Art Since 1875 2 s.h.

The ferment which began in the French Revolution and carried through World Wars I and II has been accompanied by similar revolutions and upheavals in human life and art. This course will consider the discoveries and advances in artistic expression in modern times. Subject matter for study may be found in any or all of the arts. (Seelhorst, Innes)

Art 540-541-542 Graduate Studio in Ceramics I, II, III 2-6 s.h.

These advanced courses in ceramics emphasize the total working process—the selection and preparation of clay bodies, manipulation of clay to achieve expressive form, exploration of decorative techniques. Acquiring familiarity with glaze materials and ability to formulate glazes, as well as control of the firing process, are requisites. Search for sources of equipment and supplies lead into the related aspects of studio planning. (Ross, McVitty, Dongilla)

Art 543 Exhibition Techniques 2 s.h.

Presenting works of art well has become the duty of many in the field of art. This course will consider the requirements of Museology as problems in the design of display installations. Field trips will be taken to museums in the area. (Lovette, R. Slenker)

Art 544-545-546 Graduate Studio in Fabrics I, II, III 2-6 s.h.

The fundamentals of fabric construction and some history of weaving processes are discussed. Warping, threading, and basic weaves will be included in Studio I.

Studio II and III will consider drafting and work on more complex harness looms. The experimental attitude will be maintained in all classes. (McVitty, J. Slenker)

Art 547-548-549 Graduate Studio in Jewelry and Metal Work I, II, III 2-6 s.h.

Advanced study dealing with specialized problems in the design and execution of metal work and jewelry. A thesis may be developed based upon research in one of the areas relating to this field, history, materials, tools, processes, or teaching techniques of the craft. (Cronauer, J. Slenker)

Art 550-551-552 Graduate Studio in Sculpture I, II, III 2-6 s.h.

This is an advanced course in which students are expected to work on more complex problems of sculpture. A student may explore one or several sculpture or modeling media. (Dongilla, Slenker, Vislosky)

Art 553-554-555 Graduate Studio in Crafts I, II, III 2-6 s.h.

Specialized study and experiences are related to the design and execution of problems relating to wood as a crafts material. Opportunity is presented for more intensive exploration of the materials and processes of this craft employing both hand and power tools. (Dropcho, Cronauer)

Art 556 Graduate Studio in Theater Arts or Dramatic Arts 6 s.h.

Theory and application of the techniques of designing, building, and painting of stage settings; organization and operation of production crews. This is arranged with the regular Summer Theater Play Productions. (Dropcho, Ensley)

Art 561 Graduate Studio in Drawing 2 s.h.

Drawing as a language is the principle concern of this advanced course. The continued development of skill in communication and expression in all kinds of materials and media is an objective. The drawing as an intimate work of the artist will be stressed. (Reynolds, Innes, Staff)

Art 562-563-564 Graduate Studio in Oil Painting I, II, III 2-6 s.h.

Traditional and contemporary methods and techniques in the area of plastic painting, media are experienced. Composition, in relation to the modern painters' problems, is stressed. Opportunity is presented for exploration and specialization in depth as well as breath. (Cronauer, Reynolds, Staff)

Art 565-566-567 Graduate Studio in Water Color Painting I, II, III 2-6 s.h.

Painting in transparent water color, gouache, mixed media, and with new water soluble paints, such as casein and acrylic polymer tempera. Traditional, current and experimental approaches are pursued with emphasis on design and emotional content. (Reynolds, Cronauer)

Art 568-569-570 Graduate Studio in Print Making I, II, III 2-6 s.h.

This is a study on the graduate level of the modes, media, material, techniques and processes of the graphic arts and their use in expression. The student may concentrate on the intensive exploration of one media in depth or explore a number of media for breadth of experience. (Johnson, Staff)

Art 571 Graduate Studio in Mural Painting 2 s.h.

In this course the individual student should acquire a working knowledge of the materials and processes employed in mural painting, such as fresco, encaustic, oil and mosaic. The historical development of the mural as an art form should be considered as to its influence upon, and reference to, the modern mural. (Cronauer, Seelhorst, Staff)

Art 512-515— These numbers will be reserved for seminars of visiting artists as announced.

BIOLOGY

Francis W. Liegey, Chairman

Walter W. Gallati, Director of Graduate Studies

Robert K. Alico

William E. Dietrich

William R. Forbes

Louis L. Gold

Leon J. Hue

Jan C. Humphreys

Robert E. Merritt

James H. Miller

Jerry L. Pickering

Gould F. Schrock

Martin L. Stapleton

Henry H. Vallowe

Richard F. Waechter

Cyril J. Zenisek

**REQUIREMENTS FOR ADMISSION TO THE
BIOLOGY DEPARTMENT**

The applicant must have completed the requirements for a Bachelor's degree from an accredited college or university which should include one year each of inorganic chemistry, organic chemistry, physics, and mathematics. Applicants with undergraduate deficiencies may be required to register for appropriate courses.

**REQUIREMENTS FOR CANDIDACY FOR AN M.Ed. OR AN
M.S. IN BIOLOGY**

The satisfactory completion of fifteen (15) semester hours of graduate work in the biological sciences. For the M.S. student at least six hours must be in core courses.

The selection of an adviser, and, with the adviser's approval, a committee of at least two (2) additional faculty members to guide the candidate in completing a tentative program and selecting a thesis problem or a project.

An official application for admission to candidacy, including the tentative program which has been approved by the adviser, must be submitted to the Biology Department graduate committee.

Candidates are expected to maintain an average of not lower than B. Continuance in the graduate program for those receiving two (2) course grades below the minimum is contingent upon favorable review of the graduate committee.

CURRICULUM FOR THE MASTER OF EDUCATION DEGREE

Students working for this degree with a major in Biology will complete 30 semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration—16-22 semester hours.

Bio	500	Special Studies	2-6 s.h.
Bio	522	Biometry	3 s.h.
Bio	526	Molecular Genetics	3 s.h.
Bio	530	Instrumentation	3 s.h.
Bio	533	Biological Literature	2 s.h.
Bio	536	Comparative Plant Morphology	3 s.h.
Bio	540	Protozoology	3 s.h.
Bio	545	Microtechnique	2 s.h.
Bio	546	Dendrology	3 s.h.
Bio	548	Plant Ecology	3 s.h.
Bio	551	Taxonomy of Plants	3 s.h.
Bio	553	Prin. of Animal Taxonomy	2 s.h.
Bio	554	Advanced Ornithology	3 s.h.
Bio	556	Animal Ecology	3 s.h.

Bio	557	Animal Morphogenesis	3 s.h.
Bio	558	Endocrinology	4 s.h.
Bio	559	Advanced Entomology	3 s.h.
Bio	560	Herpetology	3 s.h.
Bio	562	Animal Physiology	4 s.h.
Bio	563	Physiology of Plants	4 s.h.
Bio	566	Cellular Physiology	4 s.h.
°Bio	568	Biology Practicum	2 s.h.
Bio	575	Mammalogy	3 s.h.
Bio	576	Radiation Biology	3 s.h.
Bio	578	Mycology	3 s.h.
Bio	580	Parasitology	3 s.h.
Bio	581	Microbial Physiology	4 s.h.
Bio	582	Pathogenic Microbiology	3 s.h.
Bio	583	Immunology	3 s.h.
Bio	586	Taxonomy & Ecology of Bacteria	3 s.h.
Bio	612	Biology Seminar II	1 s.h.
Chem	651	Biochemistry	3 s.h.
Geol	570	Paleontology	2 s.h.

°Strongly recommended for, and restricted to, M.Ed. students.

II. Professional Studies—4-10 semester hours. May be selected from the following courses:

LRes	500	Seminar in Learning Resources	2 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.
Psy	532	Studies in Pupil Adjustment	2 s.h.

or may be satisfied in whole or in part by a research thesis (see IV below)

III. Foundations of Education—2 semester hours. To be selected from the following courses:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	

IV. Research Requirement—2-6 semester hours. The following course is required and should be scheduled early in order to give the student ample time to fulfill the research requirement.

Bio	600	Methods of Research in Biology	2 s.h.
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Every candidate must in addition present a research thesis for credit or a non-credit project on a topic approved by his advisor.

Grad	550	Thesis	2-4 s.h.
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CURRICULUM FOR THE MASTER OF SCIENCE DEGREE

Core Courses

Eighteen to twenty (18-20) semester hours selected from the following:

Instrumentation (Bio 530)	3 s.h.
One Morphology Course (Bio 536, 546, 557, or 559)	3 s.h.
One Physiology Course (Bio 562, 563, 566, or 581)	4 s.h.
One Ecology Course (Bio 548, 556, or 586)	3 s.h.
Methods of Research in Biology (Bio 600)	2 s.h.
Seminar (Bio 612)	1 s.h.
Thesis (Grad 550)	2-4 s.h.

Elective Courses

Ten to twelve (10-12) semester hours of courses to be selected with the approval of the adviser from the areas listed below or from related science and mathematics courses.

General Courses

Bio	500	Special Studies	2-6 s.h.
Bio	522	Biometry	3 s.h.

Bio	526	Molecular Genetics	3 s.h.
Bio	545	Microtechnique	2 s.h.
Bio	566	Cellular Physiology	4 s.h.
Bio	576	Radiation Biology	3 s.h.
Chem	651	Biochemistry	3 s.h.
Geol	570	Paleontology	3 s.h.
Botany Courses			
Bio	536	Comparative Plant Morphology	3 s.h.
Bio	546	Dendrology	3 s.h.
Bio	548	Plant Ecology	3 s.h.
Bio	551	Taxonomy of Plants	3 s.h.
Bio	563	Physiology of Plants	4 s.h.
Bio	578	Mycology	3 s.h.
Zoology Courses			
Bio	540	Protozoology	3 s.h.
Bio	553	Principles of Animal Taxonomy	2 s.h.
Bio	554	Advanced Ornithology	3 s.h.
Bio	556	Animal Ecology	3 s.h.
Bio	557	Animal Morphogenesis	3 s.h.
Bio	558	Endocrinology	4 s.h.
Bio	559	Advanced Entomology	3 s.h.
Bio	560	Herpetology	3 s.h.
Bio	562	Animal Physiology	4 s.h.
Bio	575	Mammalogy	3 s.h.
Bio	580	Parasitology	3 s.h.
Microbiology			
Bio	581	Microbial Physiology	4 s.h.
Bio	582	Pathogenic Microbiology	3 s.h.
Bio	583	Immunology	3 s.h.
Bio	586	Taxonomy and Ecology of Bacteria	3 s.h.

Resident Requirements for the M.S.:

The candidate must be in residence for at least seven (7) consecutive months of full-time work or the equivalent as determined by the candidate's advisory committee.

Research Requirements for the M.S.:

Every candidate must schedule Methods of Research in Biology (Bio 600) as part of his research requirement. This should be done early in his program.

Every candidate must present a research thesis on an original topic approved by the candidate's advisory committee. This is programmed as Grad 550 (thesis) for 2 to 4 credits.

Requirements for Completion of the M.S.:

1. (a) All students in the M.S. program in the Biology Department must pass a comprehensive examination administered by the department graduate committee. The purpose of this examination is to assure that all of our graduates have a well proportioned knowledge of the field of Biology. The examination will also help point out the student's major areas of inadequate knowledge or training.
- (b) This examination is offered at a specified time twice each year (toward the middle of each semester). Any time after the first semester of graduate studies, the student may signify his intentions of taking the examination by informing the graduate committee.
- (c) This will be the only comprehensive examination for the Master of Science degree.

2. After the thesis has been accepted in its final written form by the candidate's committee and the Graduate School, the candidate is expected to present a public seminar covering the major areas of his research.

Course Descriptions

In many courses in the Biology Department, additional laboratory time may be required beyond the regularly scheduled periods.

Bio 500 Special Studies 2-6 s.h.

This course will consist of semi-independent studies under the guidance of an instructor. Maximum credit in any one area is six (6) semester hours. Time and class hours will be arranged by the instructor involved. Prerequisite: Permission of the instructor.

Bio 522 Biometry 3 s.h.

This course is designed to acquaint the student with the kinds and treatment of biological data. The application of mathematical principles in the treatment of these data will be stressed rather than a theoretical development of the mathematical concepts. Data will be analyzed from representative measuring instruments, e.g. spectrophotometry, manometry, linear measurement, etc.

Bio 526 Molecular Genetics 3 s.h.

Molecular genetics is a study of the chemical structure of the gene in relation to its molecular function in the control of specific protein biosynthesis. Emphasis will be placed on genetic systems of bacteria, fungi, and viruses.

Bio 530 Instrumentation 3 s.h.

An introduction to instrumental technique designed to aid in the development of skills employed in biological research.

Bio 536 Comparative Plant Morphology 3 s.h.

A discussion of the procedures, general principles and objectives of comparative plant morphology. Emphasis will be placed on the relationships between morphology, taxonomy and experimental morphogenesis in the vascular plants.

Bio 540 Protozoology 3 s.h.

An introductory course which covers the common and representative genera of all groups of free-living protozoa (parasitic forms are not included). Major emphasis is placed upon the structure, physiology, ecology and life histories of these organisms. Laboratory work covers these same topics and an independent research project is required.

Bio 545 Microtechnique 2 s.h.

A course designed to acquaint the student with the procedures involved in the production of microscope slides. Techniques of preparing whole mounts, microtome sections and serial sections of both plant and animal materials.

Bio 546 Dendrology 3 s.h.

A study of the woody plants as to their identification, distribution, ecology, culture, anatomy, physiology, mensuration and utilization.

Bio 548 Plant Ecology 3 s.h.

The nature and distribution of vegetation in relation to environmental factors. Field investigations of local plant communities constitute the bulk of the laboratory work. Prerequisite: field botany, plant taxonomy or a general knowledge of local flora.

Bio 551 Taxonomy of Plants 3 s.h.

This course includes the collection, identification, and classification of vascular plant species with special emphasis on family characteristics and

phylogeny. Three hours per week throughout the year. Prerequisite: Botany I, II.

Bio 553 Principles of Animal Taxonomy 2 s.h.

This course is a study of the classification system and its application to the identification of animals. The basic principles of taxonomy, rules of nomenclature, a synoptic history of classification and the "old" and "new" taxonomy will be included. A taxonomic field study is required.

Bio 558 Endocrinology 4 s.h.

A study of the endocrine tissues from the standpoint of their phylogeny, embryology, micro-anatomy, and physiology. Prerequisites: a course in anatomy and a course in physiology.

Bio 559 Advanced Entomology 3 s.h.

The study of insect morphology including the external and internal organization of specimens of different species of insects. Comparisons and contrasts among species will be included as well as the relationships of social insects and their adaptations. Prerequisite: Biology 262.

Bio 560 Herpetology 3 s.h.

This course provides a comprehensive survey of the classes Amphibia and Reptilia. Topics for study include the classification, structure, origin, evolution, phylogenetic relationships, distribution, and natural history of amphibians and reptiles. Special emphasis is placed on the hexpetofauna of Pennsylvania.

Bio 562 Animal Physiology 4 s.h.

Through lectures and laboratory work, students will consider the events of digestion, molecular transport of nutrients and wastes, gaseous exchange, excretion, muscular movement, and control by endocrines and nervous tissue. Prerequisites: Zoology I, II.

Bio 563 Physiology of Plants 4 s.h.

A comprehensive study is made of the physical and chemical bases for the organization and function of the living plant. Much use is made of the current literature of the field. Water relations, plant nutrition, photosynthesis, growth and its regulation, and tropisms are among the topics considered. Prerequisite: Biochemistry. Closed to students with undergraduate Plant Physiology, Bio. 351.

Bio 566 Cellular Physiology 4 s.h.

The activities considered include nutrition, the uptake and preparation of food and oxygen, the release of energy, elimination of waste products, response to the environment, growth and reproduction.

Bio 568 Biology Practicum 2 s.h.

This course is designed to convey to the high school biology teacher the knowledge of the preparation of culture media and solutions. Problems and techniques unique to the biological sciences with respect to demonstration material, handling and housing of plants and animals, safety in the laboratory and in the field, and the maintenance of equipment will be discussed. Theoretical and practical work will be done with the development of on-going experiments and research projects. Handbooks and other resource materials useful in the "laboratory approach" to biology will be given special attention.

Bio 575 Mammalogy 3 s.h.

This is an introduction to the classification of mammals of North America and a review of the life histories of representatives of the various orders. Laboratory work will deal with the identification of local species and the standard procedures for collection and preservation of mammals. Two hours lecture and three hours laboratory work per week.

Bio 576 Radiation Biology 3 s.h.

Basic aspects of nuclear physics, the phenomena of radioactive isotopes and the biological effects of such isotopes. Concurrent laboratory work

utilizing instruments for detection and measurement of radioactive nuclides used in biological experimentation. Organic and biological chemistry strongly recommended.

Bio 578 Mycology **3 s.h.**

A study of the systematics, morphology, and physiology, with emphasis on economically imported and experimentally useful Myxomycophyta and Eumycophyta. Laboratory studies will include exercises in the physiology and genetics of fungi and the collecting, culturing and identifying of representative species. May not be programmed by students with undergraduate credit for Biol. 381, Mycology.

Bio 580 Parasitology **3 s.h.**

An introductory course which covers the parasitic protozoa, flatworms and roundworms. Major emphasis is placed upon species infesting man and includes their structure, physiology, ecology, life cycles, pathogenicity and treatment. Laboratory work includes some dissection of vertebrate hosts and fixing, staining and mounting of any parasites recovered. Archropods involved in parasite transmission are also included. Prerequisites: one year Biology, Vertebrate and Invertebrate Zoology.

Bio 581 Microbial Physiology **4 s.h.**

A study of the physiological reactions involved in the growth, reproduction and death of microbes. Special consideration will be placed upon the metabolism of carbohydrates, proteins, vitamins and fats. Enzymes, oxidation-reduction potentials, energy relationships, membrane potentials and required nutrients will also be considered. Prerequisites: Microbiology and Biochemistry.

Bio 582 Pathogenic Microbiology **3 s.h.**

A study of diseases caused by microorganisms with emphasis on human pathogens. Consideration is given to both the epidemiology and aspects of the host-parasite relationships. The laboratory stresses methods of isolation and identification of pathogens. Prerequisite: Microbiology.

Bio 583 Immunology **3 s.h.**

A study of the physical and chemical properties of antigens and antibodies; the nature of antigen-antibody interactions; the mechanism of antibody formation; and the immune reaction in disease. The laboratory will employ serological techniques. Prerequisites: Biochemistry and Microbiology.

Bio 586 Taxonomy and Ecology of Bacteria **3 s.h.**

A study of the isolation, cultivation, classification and ecology of the major groups of bacteria. Special emphasis is given to the principles of bacterial taxonomy and ecology. Prerequisite: Microbiology.

Bio 600 Methods of Research in Biology **2 s.h.**

The student is aided in selecting and planning a research project or thesis problem in either a biological or related educational area; will become thoroughly familiar with the general biological literature (abstracting journals, periodicals, annual reviews, etc.); will conduct a literature search on his selected topic; will write a thesis or project proposal following Graduate School guidelines and the AIBS style manual; and will give an oral presentation of the proposal. Required for both M.Ed. and M.S. candidates. (Staff)

Bio 612 Biology Seminar **1 s.h.**

This seminar gives the student an opportunity to become acquainted with the various areas of current research in biology. One hour meeting per week. Required for M.S. candidates. (Staff)

Mar. Sci. 500 Problems in Marine Science **3 s.h.**

A course in independent study for the advanced student in marine sciences. Topics are selected from the areas offered by the Marine Consortium and the studies are directed by the instructor in that area. Prerequisite: Consent of Instructor.

BUSINESS EDUCATION

J. K. Stoner, Chairman

A. E. Drumheller, Dean, School of Business

Lee R. Beaumont

Charles L. Cooper

Elsie M. Hileman

Patricia L. Patterson

John A. Polesky

Elwood B. Sheeder

Leslie S. Spencer

Dale W. Woomer

The graduate program in Business Education at Indiana is primarily designed to permit the business teacher to broaden his understanding of the business world and to study his teaching procedures in the light of new experience.

Upon admission to the Graduate School each student is tentatively assigned an adviser. The adviser assists the student in scheduling his program of studies. If the tentative assignment is mutually agreeable to the student and the adviser, the arrangement is continued.

A review of the present curriculum would indicate that from fourteen to sixteen credit hours are to be taken in a subject matter concentration area. Students should select courses in the basic business area along with courses from at least one of the areas concerned with either accounting, secretarial, or marketing. The course GRAD 515, Elements of Research, must be taken prior to BUS 522, Seminar in Business Education. Among the first courses the graduate student should take is BUS 510, Business Communications and Report Writing. These three courses should be completed by the time the student has earned twelve semester hours credit.

Courses in the subject matter concentration area should be scheduled early, making use of those courses in the general studies and foundations of education areas as they can be fitted into one's schedule as the work progresses.

Prior to his admission to candidacy for the degree (see p. 37), the business student must take the Graduate Record Examination, which includes the Aptitude Test and the Advanced Test. Information about this examination can be obtained from the advisers or the Graduate Office.

BUSINESS

Curriculum for Master of Education Degree

- I. General Studies—four to six (4-6) semester hours of work to be selected from the courses listed below. Other choices may be made with the approval of the adviser and department chairman.

Anth	592	Comparative Cultures	2 s.h.
Art	521	Contemporary Movements in Art	2 s.h.
Eng	521	Modern European Fiction	2 s.h.
Eng	523	The Development of Modern English	2 s.h.
Eng	540	Twentieth Century American Drama	2 s.h.
Geog	521	Advanced Human Geography	2 s.h.
Geog	524	Cultural Geography	2 s.h.
Hist	531	Economic and Social History of Pennsylvania	2 s.h.
HE	521	Problems in Family Living	2 s.h.
Phil	581	Problems of Logic	2 s.h.
Phil	582	Problems of Ethics	2 s.h.
Phil	583	American Philosophic Thoughts	2 s.h.
SS	521	Contemporary American Issues	2 s.h.
SS	561	Social Policy Studies	2 s.h.

- II. Subject Matter Concentration Area—fourteen to sixteen (14-16) semester hours work in subject matter content to be selected from the following: A minimum of two areas are to be chosen.

- A. Accounting**—Prerequisites of twelve hours in Accounting
- | | | | |
|-----|-----|--|--------|
| Bus | 500 | Accounting Systems | 2 s.h. |
| Bus | 501 | Principles of Tax Accounting | 2 s.h. |
| Bus | 502 | Advanced Tax Accounting | 2 s.h. |
| Bus | 503 | Financial Statement Analysis | 2 s.h. |
| Bus | 504 | Budgeting and Cost Analysis | 2 s.h. |
| Bus | 505 | Advanced Accounting | 2 s.h. |
| Bus | 506 | Interpretation of Accounting Data (for Non-Business Majors and Non-Accounting Business Students) | 2 s.h. |
- B. Secretarial**—Prerequisite of nine hours in Shorthand
- | | | | |
|-----|-----|---|--------|
| Bus | 512 | Office Organization and Management | 2 s.h. |
| Bus | 513 | Foundations of Teaching Business Skills | 2 s.h. |
| Bus | 514 | Executive Secretarial Training | 2 s.h. |
| Bus | 540 | Cooperative Work Experience in Office Occupations | 4 s.h. |
- C. Marketing**
- | | | | |
|-----|-----|---|--------|
| Bus | 520 | Retail Organization and Management | 2 s.h. |
| Bus | 521 | Principles of Marketing | 2 s.h. |
| Bus | 522 | Sales Promotion and Advertising | 2 s.h. |
| Bus | 523 | Marketing Research | 2 s.h. |
| Bus | 540 | Cooperative Work Experience in Distributive Occupations | 4 s.h. |
- D. Basic Business**
- | | | | |
|------|-----|---|--------|
| Bus | 510 | Business Communications and Report Writing | 2 s.h. |
| Bus | 531 | Principles of Investment in Securities | 2 s.h. |
| Bus | 532 | Current Business Economic Problems | 2 s.h. |
| Bus | 533 | Case Problems in Business Law | 2 s.h. |
| Bus | 534 | Consumer Economic Problems | 2 s.h. |
| Bus | 536 | Automated Data Processing I | 4 s.h. |
| Bus | 537 | Automated Data Processing II | 4 s.h. |
| Bus | 541 | Principles of Management | 2 s.h. |
| Bus | 542 | Human Relations in Business | 2 s.h. |
| Bus | 543 | Leadership Development in Business and Distributive Education | 2 s.h. |
| Econ | 525 | Money and Banking | 2 s.h. |
- III. Professional Studies**—six to ten (6-10) semester hours including a research project:
- A. General Area**
- | | | | |
|------|-----|--|----------|
| Bus | 550 | Principles and Problems of Business Education | 2 s.h. |
| Bus | 551 | Administration and Supervision of Business Education | 2 s.h. |
| Bus | 552 | Seminar in Business Education | 2 s.h. |
| Bus | 553 | Supervision of Business Vocational Education | 2 s.h. |
| Grad | 516 | Statistical Methods I | 2 s.h. |
| Grad | 550 | Thesis | 2-4 s.h. |
- B. Instructional Areas**—a minimum of two semester hours
- | | | | |
|-----|-----|---|--------|
| Bus | 560 | Improvement of Instruction in Secretarial Courses | 2 s.h. |
| Bus | 561 | Improvement of Instruction in Basic Business Courses | 2 s.h. |
| Bus | 562 | Improvement of Instruction in Accounting and Business Mathematics | 2 s.h. |
| Bus | 563 | Improvement of Instruction in Office Practice | 2 s.h. |
- IV. Foundations of Education**—two (2) semester hours of work selected from:
- | | | | |
|-------|-----|--|--------|
| Fd Ed | 511 | Historical Foundations of Education | 2 s.h. |
| Fd Ed | 512 | Philosophical Foundations of Education | 2 s.h. |
| Fd Ed | 513 | Social Foundations of Education | 2 s.h. |
- V. Research Techniques**—the following course is required. It should be scheduled early in the student's program:
- | | | | |
|------|-----|----------------------|--------|
| Grad | 515 | Elements of Research | 2 s.h. |
|------|-----|----------------------|--------|

Course Descriptions

Bus 500 Accounting Systems 2 s.h.

A study of the accounting principles as applied in constructing accounting systems. Special attention will be given to the problems of management as they relate to accounting systems. This is to be done with the idea of building a system to give management the information desired for effective operation of the business. (Stoner)

Bus 501 Principles of Tax Accounting 2 s.h.

The fundamentals of Federal Income Tax Accounting are presented under the latest amendments to the Internal Revenue Code. The various income tax blanks and forms are presented and filled in with special emphasis upon the returns of individuals, single proprietorships and partnerships. Students who have completed Bus 454—Tax Accounting should not program this course. (Drumheller)

Bus 502 Advanced Tax Accounting 2 s.h.

This course is designed to give the student further familiarity with the Federal Income Tax law with emphasis upon the law concerning corporate returns, estates and trusts, federal estate tax and gift tax. Bus 501, or its equivalent, is a prerequisite to taking this course. (Drumheller)

Bus 503 Financial Statement Analysis 2 s.h.

This course is designed to give a detailed analysis and interpretation of financial statements with advanced problems supporting the theory presented. Particular types of statements as they apply to public utilities, industrials, and moneyed corporations are introduced. (Stoner)

Bus 504 Budgeting and Cost Analysis 2 s.h.

The preparation and use of flexible expense budgets; the establishment of production cost standards and the analysis of cost variances; extensive analysis of cost control and profit planning programs; and direct costing. Prerequisite: Elementary Cost. (Cooper)

Bus 505 Advanced Accounting 2 s.h.

This course is designed to emphasize the specialized phases of accounting, such as joint ventures and syndicates, installment sales, consignments, domestic agencies and branches, consolidated statements, and application of funds statements. (Cooper)

Bus 506 Interpretation of Accounting Data 2 s.h.

This is an accounting course for non-accounting students. It is designed to provide an understanding of accounting data from the viewpoints of management, investors, or potential investors. "How to do accounting" is not a prerequisite and is not an objective of this course. (Cooper)

Bus 510 Business Communications and Report Writing 2 s.h.

A study and comparison of effective written communications. Emphasis on the positive approach, clear statements, and good form and structure. The organization and preparation of reports of the types used in education, business and government. Techniques of collecting, interpreting, and presenting information useful to executives will be studied. (Hileman)

Bus 511 Advanced Shorthand For Teachers (deleted, see Bus 513)**Bus 512 Office Organization and Management** 2 s.h.

Duties and responsibilities of the office manager; principles of practical office management and their application. Includes survey and analysis development of manuals and their use; selection, training, pay and promotion of office employees; controlling expense and measuring office efficiency; quality and quantity standards; purchase and use of equipment; and report writing. (Hileman)

Bus 513 Foundations of Teaching Business Skills 2 s.h.

This course is designed to increase the student's understanding of the philosophical and psychological bases of teaching business skill subjects.

Through discussion and research, students explore the rationals and principles for developing skills as they apply to specific business courses taught in the secondary schools and community colleges. (Beaumont)

Bus 514 Executive Secretarial Training 2 s.h.

This course for teachers will stress the application of secretarial skills and knowledges and emphasize the importance of good human relations in the office. This course will show ways to complement the secretarial training so that high school graduates may become competent, proficient, and well-adjusted secretaries. (Hileman)

Bus 520 Retail Organization and Management 2 s.h.

This course will be directed toward the many problems of retail management. It will include a study of the present-day trends in retailing, personnel management, merchandise control, pricing, promotion, services, accounting, and expense control. (Sheeder)

Bus 521 Principles of Marketing 2 s.h.

A study of the risks, costs, and methods in the distribution of goods of farm and industry. A comprehensive analysis of such problems as research, competition, pricing, and laws in marketing goods from the manufacturer or producer to the consumer. (Sheeder)

Bus 522 Sales Promotion and Advertising 2 s.h.

An introduction to the basic principles of sales promotion and advertising together with a consideration of the major problems encountered in the management of these activities. Major emphasis is placed on the determination of basic promotional strategy; selection of advertising media; determining the advertising appropriations; and advertising research. Advertising is discussed as an institution performing social and economic functions. (Sheeder)

Bus 523 Marketing Research 2 s.h.

A study of research procedures and techniques applicable to problem solving in the field of marketing. A critical analysis of research techniques with considerable emphasis placed on orientating the student to the use of information gathered. Prerequisite: Marketing. (Sheeder)

Econ 525 Money and Banking 2 s.h.

The course is offered to the Economics Department.

Bus 531 Principles of Investment in Securities 2 s.h.

It is the purpose of this course to familiarize the student with the many forms of investment possibilities which exist. Attention will be given to the operation of the stock markets, concepts and terminology of investing, mutual funds and their function, investment clubs and the problems involved in making investments through brokers, bankers, and stock promoters. (Cooper)

Bus 532 Current Business Economic Problems 2 s.h.

This course is designed to provide an opportunity for the students to gain insights into the relationship of business to the many facets of society, the impact of major societal groups upon business, and the nature of obstacles that businessmen face in day-to-day operations. A review and analysis of basic economic concepts and principles will serve as a basis for the study of selected economic problems of current interest and concern to business and society. (Beaumont)

Bus 533 Case Problems in Business Law 2 s.h.

It is to be assumed that the student has a knowledge and background of the theory of business law prior to taking this course. The course deals with the solution of case problems as applied to the various topics in the field of business law. (Woomer)

Bus 534 Consumer Economic Problems 2 s.h.

A program for the education of intelligent consumers is planned for this course. How to gain the maximum satisfaction from goods and services available to the consumer is an important consideration. An effort will be

made to develop an appreciation of the problems of the producer, and distributor, as well as those of the consumer. (Polesky)

Bus 536 Automated Data Processing I 4 s.h.

This course covers the theory and operation of automated data processing equipment. Input devices will include the key punch, paper tape punch and the keyboard to magnetic tape equipment. Semi-automatic accounting machines and ledger posting devices will be studied. The output devices such as the reader-punch, reproducer, interpreter and other equipment will be covered. 2 hr. lecture and 2 hr. lab. Prerequisite: Certificate to teach. (Shildt or Spencer)

Bus 537 Automated Data Processing II 4 s.h.

This course will develop the principles of Assembler Language Programming with specific applications for the teachers of business and distributive education. The course will build upon the basic concepts of data processing developed in Bus 536. Special emphasis will be placed on computer based instruction and programmed instruction as used with the console typewriter and remote terminals. The value of library programs will be demonstrated. 2 hr. lecture and 2 hr. lab. Prerequisite: Certificate to teach and Bus 536 or its equivalent. (Shildt or Spencer)

**Bus 540 Cooperative Work Experience in Office
or Distributive Occupations** 4 s.h.

The graduate student who has not had extensive business experience is given the opportunity to work full-time for six weeks during the summer in a business position under the supervisor of the university. Evening seminars will be held weekly to discuss problems related to the work experience program and the cooperative plan of vocational instruction. A written report of the experience will be required. (Staff)

Bus 541 Principles of Management 2 s.h.

The course is a study of the development, nature, and meaning of the basic functional principles involved in planning, organizing, and controlling the activities of an organization at all levels of management. The application of these principles in the general area of production, marketing, finance, and personnel will be analyzed. (Patterson)

Bus 542 Human Relations in Business 2 s.h.

Human motivations and their constructive application to all aspects of business form the central theme of this course. The psychological basis of human relations will be developed as it applies in the business world. Major topics include employer-employee relations, labor relations, stockholder relations, customer relations, community relations, and public relations. (Beaumont)

**Bus 543 Leadership Development in Business and
Distributive Education** 2 s.h.

This course will include methods, procedures and programs for developing leadership in teachers and teacher-coordinators of secondary, post secondary and adult programs in business and distributive education. There will be emphasis on the coordination of activities of school and business working with community leaders in developing and maintaining an effective vocational business program. The promotion and development of youth groups will be an important objective of this course. (Beaumont)

Bus 550 Principles and Problems of Business Education 2 s.h.

The purpose of this course is to survey the basic principles and practices of business education. Among the topics considered are: history of the high school business program, purposes, attitudes of management and labor toward education, the relationship of general education to business education, and trends in the field. (Stoner)

Bus 551 Administration and Supervision of Business Education 2 s.h.

This course offers an opportunity to study the problems of organizing, directing, and supervising business education programs. Such matters as the

functions of the administrator and supervisor of business education, textbook selection, teacher selection, testing programs, conferences, equipment and layout are considered. (Drumheller)

Bus 552 Seminar in Business Education 2 s.h.

This course is devoted to a critical examination and evaluation of current literature and research in business education. The graduate student is expected to conduct an extensive study of literature representative of the entire field of business and an intensive study in one or more specialized areas compatible with his professional interests and activities. Investigation of procedures used in current and outstanding research studies is emphasized. (Beaumont or Woomer)

Bus 553 Supervision of Business Vocational Education 2 s.h.

This course offers an opportunity to study the problems of organizing, directing, and supervising a vocational education program in business. Special emphasis will be placed on the implementation of programs in distributive and office education as proposed under the various Vocational Arts. (Woomer)

Bus 560 Improvement of Instruction in Secretarial Courses 2 s.h.

A course for experienced business teachers. Teaching procedures basic to the development of vocational proficiency in shorthand, typewriting, and transcription including: content; methods; teaching aids; available instructional materials; measurement of skills; and standards of achievement. (Hileman)

Bus 561 Improvement of Instruction in Basic Business Courses 2 s.h.

This course is designed for experienced classroom teachers and for prospective teachers specializing in the basic business subjects. It deals with the aims of business education; its relation to vocational and general education; available instructional materials; curricular organization; teaching aids and devices; techniques for improving instruction; and other teaching problems of such subjects as junior business training or general business, economic geography, business law, consumer education, salesmanship, and business economics. (Polesky)

Bus 562 Improvement of Instruction in Accounting and Business Mathematics 2 s.h.

A study of problems and techniques in the teaching of accounting and business mathematics for experienced and prospective business teachers. Topics include the objectives, the place and purpose of accounting and mathematics in the business curriculum of the secondary schools and community colleges. The course includes planning for teaching and the techniques for improving instruction. Course standards, resource materials, the use of practice sets, testing and evaluation are important in this course. Instruction will be geared to meet the special needs of the students. (Stoner)

Bus 563 Improvement of Instruction in Office Practice 2 s.h.

This course is designed to provide business teachers with a working philosophy and practical approach to the teaching of office machines and equipment in the secondary schools and community colleges. Through readings and discussions, the student will develop plans and techniques for implementing office practice courses. "Hands-on" experience in the use of a variety of modern office equipment will be provided. (Patterson)

Bus 570 Economic Backgrounds of Business 2 s.h.

This course is designed to provide a thorough overview of the economic environment in which business and other agencies must operate. The student will gain a broad perspective of business operation through such topics as business organization and management, consumption of goods, business risks, business cycle, budgeting and investments. This course is not open to Business Education Majors, but is designed as a general studies course for other programs. (Polesky or Stoner)

DEPARTMENT OF CHEMISTRY

Paul R. Wunz, Jr., Chairman

Carl W. Bordas	Richard W. Kolaczkowski
Nicholas D. Christodouleas	Ronald L. Marks
Edward G. Coleman	Donald R. McKelvey
Joseph J. Costa	Robert A. Patsiga
Frank Fazio	Augusta Syty
Richard A. Hartline	Stanford L. Tackett
William I. Heard	Donald N. Zimmerman
Deanna J. Keyton	

The chemistry department offers both the Master of Education and the Master of Science degree in chemistry. Each program is designed to meet the specific needs of the persons enrolled in the programs.

The Master of Education program is designed for the secondary school teacher. It is the purpose of this program to afford the teacher the opportunity to increase his knowledge of chemistry and keep abreast of a rapidly changing field. The major emphasis is on subject matter.

The Master of Science degree is for the chemist who intends to pursue further graduate work leading to a Ph.D. or who intends to work as a professional chemist and desires to become more competent in chemistry. This degree is research oriented and successful completion of an experimental thesis is required.

Four core courses, one in each of the areas of inorganic, organic, analytical, and physical chemistry, are required in both the M.Ed. and the M.S. degree programs. Beyond this point the two programs separate with the M.S. student taking more specialized work in chemistry along with an experimental research problem, while the M.Ed. candidate will take broadening courses which will make him a more effective teacher.

Curriculum for Master of Education Degree in Chemistry

Students planning to complete this program should have one year each of General Chemistry, Analytical Chemistry, Organic Chemistry, Physical Chemistry, and General Physics, as well as Mathematics through Integral Calculus.

Students working for this degree with a major in Chemistry will complete a minimum of thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration Area—twenty to twenty-two (20-22) semester hours of work as follows:

A. Required Courses

Chem 610	Inorganic Chemistry (Core Course)	3 s.h.
Chem 620	Analytical Chemistry (Core Course)	3 s.h.
Chem 630	Organic Chemistry (Core Course)	3 s.h.
Chem 640	Physical Chemistry (Core Course)	3 s.h.

B. Elective Chemistry Courses—eight to ten (8-10) semester hours of work elected from the following courses:

Chem 505	Chemical Systems	2 s.h.
Chem 506	Chemistry, An Experimental Science	2 s.h.
Chem 522	Advanced Instrumental Methods of Analysis	2 s.h.
Chem 546-547	Biochemistry I and II	2 s.h./sem.
Chem 576	Radiochemistry	2 s.h.
Sci 572	Experimental Techniques in Chemistry and Physics	2 s.h.
Chem 602	Chemistry in Manufacturing Processes	2 s.h.

II. Foundations of Education—two (2) semester hours. One course must be selected from these offerings:

Ed 511	Historical Foundations of Education	2 s.h.
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|----|-----|--|-------|--------|
| Ed | 512 | Philosophical Foundations of Education | | 2 s.h. |
| Ed | 513 | Social Foundations of Education | | 2 s.h. |
- III. Research Requirements—two to six (2-6)* semester hours. A thesis or research project is required of each student. The thesis may earn from two to four semester hours credit.
- | | | | | |
|------|-----|---------------------|-------|----------|
| Grad | 550 | Thesis and Research | | 2-4 s.h. |
|------|-----|---------------------|-------|----------|
- *A research project fulfills this requirement, but does not earn any semester hour credit.
- | | | | | |
|------|-----|----------------------|-------|--------|
| Grad | 515 | Elements of Research | or | |
| Chem | 533 | Chemical Literature | ..... | 2 s.h. |
- IV. Non-Chemistry Electives—zero to six (0-6) semester hours. The student may complete the thirty (30) semester hour requirement by choosing from among any of the non-chemistry offerings of the Graduate School with the advice and approval of his graduate adviser. The student must satisfy any stated prerequisites for the elective courses.

Curriculum for Master of Science Degree in Chemistry

Admission requirements: (1) a Bachelor's degree from an accredited college or university and an undergraduate grade point average of 2.5 or better; (2) satisfactory scores on the advanced test in chemistry in the Graduate Record Examination, which results are used for determining deficiencies and for planning the student's program; (3) acceptance by the Chemistry Department M.S. committee.

Requirements for Candidacy for the M.S. in Chemistry

The following requirements must be met by a student before he can become a candidate for a M.S. degree in chemistry:

- (1) Submit an official application for admission to candidacy.
- (2) Submit a transcript of graduate work completed at other institutions.
- (3) Complete at least six (6) semester hours of graduate work at Indiana in courses designated by 600 chemistry numbers, not including thesis and research.
- (4) Receive satisfactory course evaluation from graduate instructors.
- (5) Submit a tentative program of study for the completion of the graduate program.

Residence Requirements

The student shall be in residence two (2) consecutive semesters of full-time work or the equivalent, as determined by the student's supervisory committee.

Course Requirements*

- (1) Core Curriculum—Fourteen to fifteen (14-15) semester hours of work consisting of the following courses:

Chem 610	Inorganic Chemistry (Core Course)	.....	3 s.h.
Chem 620	Analytical Chemistry (Core Course)	.....	3 s.h.
Chem 630	Organic Chemistry (Core Course)	.....	3 s.h.
Chem 640	Physical Chemistry (Core Course)	.....	3 s.h.

 One additional course designated by 600 Chemistry numbers selected from one of the four core areas. 2-3 s.h.

- (2) Electives—five to six (5-6) semester hours.

The electives may be selected from the areas of Chemistry, Physics, Biology, and Mathematics by the student with the advice and approval of his adviser.

Chem 500, Special Studies, (1-6 s.h./sem.) can provide a maximum of two (2) semester hours toward the thirty (30) semester

hours necessary for the degree. This course can not be used as a substitute for Grad 550.

*For those students emphasizing Biochemistry the Core Curriculum is modified to stress Biochemistry and Biology. Specific details can be obtained from the Chairman of the Chemistry Department.

Research and Thesis Requirements—ten (10) semester hours required.

- (1) Grad 550 Research and Thesis 1-8 s.h./sem.
The research work must lead to an acceptable thesis, approved by the student's adviser and supervisory committee, and defended in a final oral examination.
- (2) Seminar—two (2) semester hours required
Chem 600 Seminar 1 s.h./sem.

Course Descriptions

Chem 500 Special Studies 1-6 s.h./sem.

The course to be arranged with the instructor, is to provide the student with the opportunity for an intensive survey of the literature in a particular area as well as individual instruction on recent advances in chemical instrumentation, methods of research, and specialized subject areas.

Chem 505 Chemical Systems 2 s.h.

This course is designed to combine imaginative ideas and a great many chemical facts into an intelligible whole. Known as the Chemical Bond Approach (CBA), the course will be taught toward an understanding of the chemical content and laboratory techniques necessary to comprehend Chemical Systems.

Chem 506 Chemistry, An Experimental Science 2 s.h.

The course will place heavy stress on the experimental approach to the study of chemistry. The course, being completely laboratory oriented, will utilize the activities of science such as observation, search for regularities, creation and testing of models. This procedure will enable the student to understand atomic theory, mole concept, nature of chemical reactions, and chemical periodicity.

Chem 533 Chemical Literature 2 s.h.

The purpose of this course is to give the graduate student an opportunity to become more familiar with chemistry literature and to develop skill in the use of the literature. Periodicals, encyclopedias, handbooks, abstracting journals and other books dealing with the various divisions of chemistry will be studied. Students are required to conduct a literature search on a selected topic. Lecture—2 hours.

Chem 576 Radiochemistry 2 s.h.

Basic aspects of nuclear structure, the phenomena of radioactive isotopes and the chemical effects of such isotopes will be studied. Concurrent laboratory work utilizing instruments for detection and measurement of radioactive nuclides used in chemical experimentation will be done. Lecture - laboratory —3 hours.

Chem 600 Seminar 1 s.h.

A study of modern chemical research and research techniques. Scientific communication, including the role of the science library in research will be stressed. Students are required to take two semesters of this course. Lecture—1 hour.

Chem 602 Chemistry in Manufacturing Processes 3 s.h.

A course dealing with the applications of chemistry to manufacturing processes. Lecture and field trips. Lecture—3 hours.

Grad 550 Research and Thesis 1-8 s.h./sem.

Laboratory and literature work on the student's thesis problem done under the direction of a faculty member. This course should be started as soon as is practical.

Sci 572 Experimental Techniques in Chemistry and Physics 2 s.h.

Emphasis will be placed on scholarly experience in experimentation, observation, and application of scientific concepts. Classroom and lecture demonstrations will be prepared, presented, and evaluated by students and instructor. Special attention will be given to the development of new ideas and new ways of presenting scientific principles. Prerequisites: Chemistry I, II, Physics I, II. (Bordas)

INORGANIC

Chem 610 Inorganic Chemistry (core course) 3 s.h.

A lecture course designed to acquaint the student with theoretical inorganic chemistry and, in particular, structure, periodicity, coordination chemistry, bonding and the chemistry of non-aqueous solvents. Lecture—3 hours.

Chem 611 Coordination Chemistry 3 s.h.

This course will deal descriptively and theoretically with the chemistry of transition metals, their compounds and complex ions. Lecture—3 hours.

Chem 612 Rare Earth Chemistry 2 s.h.

A course designed to deal with the theoretical and descriptive chemistry of the Lanthanum and Actinium series of elements. Lecture—2 hours.

Chem 613 Chemistry of the Representative Elements 2 s.h.

Essentially a descriptive course of the periodic group A elements and their compounds. Lecture—2 hours.

Chem 614 Inorganic Preparations 3 s.h.

The course deals with the preparation of inorganic compounds, expressing different techniques of synthesis. This course is designed for those students who have chosen to do inorganic research but have never had a preps course. One lecture per week and six hours of lab.

ANALYTICAL

Chem 522 Advanced Instrumental Methods of Analysis 2 s.h.

A survey of modern instrumental analysis including electrical methods, Spectrophotometric methods, x-ray methods, gas chromatography, and others as time permits. (Open to M.S. candidates by permission only).

Chem 620 Analytical Chemistry (core course) 3 s.h.

Theoretical principles of Analytical Chemistry. Lecture—3 hours.

Chem 621 Electroanalytical Chemistry 3 s.h.

Theoretical and practical considerations of Polarography, Potentiometric, amperometric, coulometric, and conductometric methods of chemical analysis. Lecture—2 hours. One 4-hour lab. per week.

Chem 622 Spectrochemical Methods of Analysis 3 s.h.

Application of the emission and absorption of light in the ultraviolet, visible and infrared regions to problems involving inorganic and organic molecular structure, analysis, equilibrium and reaction rates. Lecture—2 hours. One 4-hour laboratory per week.

Chem 623 Physical and Chemical Methods of Separation 3 s.h.

The application of chromatographic methods to the quantitative separation and analysis of chemical systems. Topics will include gas, column, paper, and ion exchange chromatographic methods and other methods of separation as time permits. Lecture—2 hours. One 4-hour laboratory per week.

ORGANIC

Chem 630 Organic Chemistry (core course) 3 s.h.

The study of organic chemistry through a consideration of the mechanisms of organic reactions. The reasons why and how organic reactions occur will be discussed. Lecture—3 hours.

Chem 631 Polymer Chemistry 3 s.h.

A study of the chemistry of macromolecules, both natural polymers and synthetic polymers, including mechanisms of polymerization. Lecture—3 hours.

Chem 632 Stereochemistry 3 s.h.

The effect of spatial arrangement of atoms on the chemical and physical properties of molecules will be studied. Lecture—3 hours.

Chem 633 Heterocyclic Chemistry 3 s.h.

The chemistry of those cyclic compounds containing a ring atom other than carbon will be considered from the standpoint of both chemical and physical properties.

Chem 634 Synthetic Organic Chemistry 2 s.h.

This course is designed to bring to the student the newer and important preparative methods in organic chemistry at both the theoretical and practical level. Lecture—1 hour; lab. 4 hours.

PHYSICAL CHEMISTRY

Chem 640 Physical Chemistry (core course) 3 s.h.

The course provides a basic introduction to topics covered in advanced graduate courses. Lecture—3 hours.

Chem 641 Statistical Thermodynamics 3 s.h.

The application of statistical mechanics to chemical systems. Lecture—3 hours.

Chem 642 Chemical Kinetics 3 s.h.

The course provides an introduction to empirical and theoretical chemical kinetics. Lecture—3 hours.

Chem 643 Quantum Chemistry 3 s.h.

An introduction to quantum theory and its application to atomic and molecular structure, and spectroscopy. Lecture—3 hours.

Chem 644 Chemistry of Solids 3 s.h.

A laboratory course which applies chemical principles and utilizes modern instrumentation to investigate the properties of solids. (Lecture and lab.)

BIOCHEMISTRY

Chem 546-547 Biochemistry I and II 2 s.h./sem.

Courses covering and emphasizing the most recent developments in the areas of biochemistry such as amino acids, carbohydrates, lipids, nucleic acids, proteins, enzymes, metabolism and metabolic control. Lecture—2 hours.

Chem 651 Biochemistry Topics 3 s.h.

A discussion of the important areas of biochemistry such as carbohydrates, lipids, amino acids, proteins, nucleic acids, kinetics, and metabolism. Lecture—3 hours.

Chem 652 Enzymes 3 s.h.

A study of enzymes to include isolation, kinetics, classification, specificity, mechanisms, cofactors, structure and formation. Lecture—3 hours.

COUNSELOR EDUCATION

George L. Spinelli, Chairman

William J. Leventry
Everett J. Pesci
Robert H. Saylor

Edward D. Shaffer
Jane B. Washburn
James C. Wilson

Cooperating Staff—Student Personnel Services in Higher Education*

James W. Laughlin, Coordinator

Fred R. Dakak
S. Trevor Hadley

E. Samuel Hoenstine
George W. Murdoch

Students seeking preparation in counselor education may qualify for enrollment in one of two degree programs and in one of three certification programs.

Degree Programs

Degree programs include the Master of Education and Master of Arts in Counseling Services. The Master of Education degree program is designed for students seeking preparation and certification as elementary school counselors or secondary school counselors. The Master of Arts in Counseling Services degree program is designed for students seeking preparation leading to guidance-related employment in non-school settings and student personnel services in higher education. Selection of one degree program over the other is determined by individual qualifications of applicants as reflected in educational-vocational background and purposes to be served in present and future employment.

Students may apply for candidacy in a degree program upon successful completion of six (6) credit hours of coursework in foundations courses and submittal of scores from the Graduate Record Examination general test. Students in the M.Ed. degree program must also schedule the advanced GRE test in Education (#34).

Upon admission to the Graduate School and the Department, the student is assigned an adviser who assists with all program matters. Subsequently, no course schedule will be accepted without prior adviser approval. Appropriate Permit to Register Forms may be obtained from the adviser or from the Department office. Minimum requirements for degree programs include thirty (30) credit hours of coursework and completion of a research project or thesis on a topic relevant to the program in which the student is enrolled.

Certification Programs

School Counselors. To qualify for institutional endorsement for provisional certification as an elementary or secondary school counselor, the student must complete all prescribed coursework and related examination and research requirements for the Master's of Education degree as defined by the Graduate School and the Department.

Counselor education majors should have a good understanding of educational philosophy, objectives, and practices. They should also have an understanding of the basic principles of psychology, sociology and anthropology, and sufficient background in mathematics to comprehend the statistical materials and methods with which the counselor must be familiar. Prospective students should include introductory courses in these areas in their undergraduate preparation.

Supervisor of Guidance Services. Applicants must meet all requirements for admission to the Graduate School and hold at least provisional certification as an elementary or secondary school counselor, including the Master of Education degree. Applicants must also have at least one year of full-time experience as a school counselor.

Institutional and departmental endorsement for provisional certification as a Supervisor of Guidance Services includes completion of an adviser approved program.

Curriculum in Counselor Education

Course requirements in all degree and certification programs are determined with the assistance and approval of the student's departmental adviser. Students may also select courses as electives from the Supervisor's program.

Area I: Foundations

Bus	541	Principles of Management (Sup)	2 s.h.
CnEd	531	Philosophy and Principles of Guidance	2 s.h.
Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	
		Select one of the above (M.Ed. students only)	2 s.h.
Grad	516	Statistical Methods I	2 s.h.
SPS	526	History and Administration of Higher Education	
		in the U.S.A.	2 s.h.
SPS	527	Student Personnel Services in Higher Education	2 s.h.

Area II: Interdisciplinary Studies

Six (6) semester hours are required from this area. Selection will be based upon student needs and adviser approval.

El	531	Curriculum Problems in Elementary Education	2 s.h.
El	533	Reading Disabilities of Elementary School Children	2 s.h.
El	550	The Community and the Elementary School	2 s.h.
El	551	Recent Innovations in Elementary Education	2 s.h.
EdPsy	502	Advanced Educational Psychology	2 s.h.
EdPsy	572	Advanced Psychology of Childhood Education	2 s.h.
EdPsy	573	Advanced Psychology of Adolescent Education	2 s.h.
EdPsy	576	Advanced Studies in Behavior Problems	2 s.h.
Psy	530	Psychology of Growth and Development	2 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.
Psy	533	Psychology of Personality	2 s.h.
Psy	536	Psychology of Learning	2 s.h.
Psy	540	Advanced Mental Hygiene	2 s.h.
Anth	591	Studies in Anthropology	2 s.h.
Anth	592	Comparative Cultures	2 s.h.
Econ	501	Foundations of Modern Economics	2 s.h.
Soc	562	Deviant Behavior	2 s.h.
Soc	563	Intergroup Relations	2 s.h.
SS	561	Social Policy Studies	2 s.h.

Area III: Professional Studies

CnEd	533	Evaluation Techniques: Principles	2 s.h.
CnEd	534	Evaluation Techniques: Applications (Sec)	2 s.h.
CnEd	524	Evaluation Techniques: Applications (Elem)	2 s.h.
CnEd	535	Case Study Techniques (Sec)	2 s.h.
CnEd	525	Case Study Techniques (Elem)	2 s.h.
CnEd	536	Information Service (Sec)	2 s.h.
CnEd	526	Information Service (Elem)	2 s.h.
CnEd	537	Counseling and Consultative Theory (Sec)	2 s.h.
CnEd	527	Consultative and Counseling Theory (Elem)	2 s.h.
CnEd	539	Group Procedures (Sec)	2 s.h.
CnEd	529	Group Procedures (Elem)	2 s.h.
CnEd	538	Management of the Guidance Services	2 s.h.
CnEd	541	Supervised Practicum (Sec)	4 s.h.
CnEd	540	Supervised Practicum (Elem)	4 s.h.

CnEd	542	School Services (Sup)	2 s.h.
CnEd	543	Planning Principles (Sup)	4 s.h.
CnEd	544	Organizing Principles (Sup)	2 s.h.
CnEd	545	Human Relations and Communications (Sup)	2 s.h.
CnEd	546	Encounter and Sensitivity in Counseling (Sup)	2 s.h.
CnEd	550	Supervision of Guidance Workers	4 s.h.
CnEd	551	Evaluation of Guidance Services (Sup)	2 s.h.
CSci	502	Computers in Education (Sup)	3 s.h.
Grad	515	Elements of Research (CnEd majors)	2 s.h.
Grad	550	Thesis	2-4 s.h.
SPS	528	Internship in Student Personnel Services	2-4 s.h.
SPS	529	Seminar in Student Personnel Administration	2 s.h.

Course Descriptions

CnEd 531 Philosophy and Principles of Guidance 2 s.h.

This course is designed to give an overview of the genesis and development of guidance in American education. Philosophical concepts, psychological theories, cultural and social influences, and current practices are explored in the guidance context.

CnEd 533 Evaluation Techniques: Principles 2 s.h.

This course is designed to present the basic concepts utilized in testing. Data concerning the purposes and types of tests, test administration, test scoring, test validity, and test selection will be carefully developed. Prerequisites: CnEd 531, Grad 516.

CnEd 524 Evaluation Techniques: Applications (Elem) 2 s.h.

CnEd 534 Evaluation Techniques: Applications (Sec) 2 s.h.

In this course the student will make an intensive study of selected representative tests and instruments in areas of aptitude, achievement, interest, and personality. Majors will deal with applications most significant to their areas of interest and need. Prerequisite: CnEd 533.

CnEd 525 Case Study Technique (Elem) 2 s.h.

CnEd 535 Case Study Technique (Sec) 2 s.h.

This course is designed to permit the student to study the principles, problems, methods, and content involved in understanding the individual student. This course draws together from all possible sources the kind of information the counselor will need to understand the individual pupil and his developing self-concept. Prerequisites: CnEd 531, 533.

CnEd 526 Information Service (Elem) 2 s.h.

CnEd 536 Information Service (Sec) 2 s.h.

This course is designed to present the information service as a distinct and vital part of the total guidance service. Emphasis is placed upon the relationship between the information service and other guidance services; the theories related to decision making; the use of information in the process of educational, social, and vocational development; the collection, evaluation, filing, and uses of information; and the programming of information activities. Prerequisite: CnEd 531.

CnEd 527 Consultative and Counseling Theory (Elem) 2 s.h.

CnEd 537 Counseling and Consultative Theory (Sec) 2 s.h.

The primary purpose of this course is to help the student acquire the requisite theoretical and perceptual background for the counseling and consultative functions in guidance. Theories, objectives, principles, and practices of counseling and consulting with individuals are covered. Interview techniques are presented for maximum development in the subsequent practicum experience. Prerequisites: CnEd 533, 535.

CnEd 538 Management of the Guidance Services 2 s.h.

It is the primary purpose of this course to help the guidance counselor acquire the necessary competencies to manage the guidance services. Emphasis is placed upon the planning, organizing, coordinating, directing, and con-

trolling functions of management as applied to guidance services within the framework of the school's philosophy and statement of objectives. Prerequisites: CnEd 531, 533, 534, 535, 536, 537, 539.

CnEd 529 Group Procedures (Elem) 2 s.h.

CnEd 539 Group Procedures (Sec) 2 s.h.

This course is designed primarily to consider group procedures in guidance and give the counselor a matrix for the successful use of the various techniques used in the group approach. Considerable emphasis will be placed upon the nature of groups, the techniques involved in the development of the dynamics of group behavior, the formation and operation of groups, the organization and structure of groups, and the influence of the group upon the individual as they relate to common problems. Prerequisite: CnEd 531.

CnEd 540 Supervised Practicum (Elem) 4 s.h.

CnEd 541 Supervised Practicum (Sec) 4 s.h.

This course provides a practicum experience in counseling and consulting techniques to include the interview, observations, written reports, and group interaction. Students work with counselees appropriate to their level of preparation and goals. Emphasis is both developmental and problem-centered but consistent with the view that guidance services extend to all. Since aspects of all component guidance services are included, this course is scheduled as a terminal course in the core sequence.

CnEd 542 School Services 2 s.h.

This course is designed to analyze critically the written statements of educational philosophies and objectives of selected elementary and secondary schools. The student will prepare a written statement of educational philosophy and objectives for a school in which he is or has been employed. This statement will serve as a guide for the critical examination of philosophies and objectives for the school services—instructional, administration and supervisory, and pupil personnel. The philosophies, objectives, and functions of the school services will be examined to permit the director of guidance services to understand the relationship of the guidance services to the school services in order to function meaningfully with the personnel of the school services.

CnEd 543 Planning Principles 4 s.h.

The student will develop written statements of guidance services philosophy and objectives. Program elements for each of the guidance services will be established from the objectives. These elements will be critically analyzed to determine personnel needs, facilities, and materials necessary, in-service program requirements, and budgetary demands. Prerequisites: Bus 541, CnEd 542.

CnEd 544 Organizing Principles 2 s.h.

The student will identify tasks necessary to the program fulfillment of guidance services objectives. Personnel qualified to perform tasks will be identified. Techniques to relate tasks to personnel will be examined to develop structural patterns necessary to initiate guidance services programs in districts of various sizes and compositions. Prerequisite: CnEd 543.

CnEd 545 Human Relations and Communications 2 s.h.

The student will develop skill in programming the various guidance services for the school year throughout the district. Human relations principles and techniques to elicit cooperation from personnel involved in the program of guidance services will be examined. Skills in communicating with personnel participating in the program of guidance services and with the public will be developed.

CnEd 546 Encounter and Sensitivity in Counseling 2 s.h.

This course is a basic workshop in personal growth and interpersonal relations. Participants will explore their own individuality and human potential as they enter into authentic, honest, and trusting relationships within the context of a small group experience. The learning process will

encourage the recognition and expression of feelings as an effective way of understanding one's self and impact on others. Enrollment is with consent of instructor.

CnEd 550 Supervision of Guidance Workers 4 s.h.

This course is a practicum designed to provide allied experience in the supervision of school counselors, elementary and secondary, in the preparation of supervisors of guidance services. Primary focus is on the supervision of counseling service content and process, but components of all guidance services are included. Enrollment is with consent of instructor.

CnEd 551 Evaluation of Guidance Services 2 s.h.

The student will acquire the skill to evaluate the program of guidance services as it is related to the educational objectives and the guidance services objectives of the school. This will include the initiation of appropriate research and the preparation and reporting of recommendations based upon the findings. Prerequisite: CnEd 544.

SPS 526 History and Administration of Higher Education in the United States 2 s.h.

The fundamental purposes of this course is to highlight the growth and trends of higher education in the United States with emphasis on the twentieth century. It reviews the administrative problems and educational issues, touches on some characteristics of higher education in economic analysis and cost, financing, level of investment and assessing the returns. The course will identify some of the administrative problems as related to the legal aspects of higher education as it affects the university staff, the public and the students with some court cases reviewed and compared.

SPS 527 Student Personnel Services in Higher Education 2 s.h.

This basic course gives an overview of student personnel work in higher education, highlighting its history, purposes, organization, philosophy, ethical values, current and past social and legal issues in institutions of higher learning. In addition, it gives an overview of the various student services which include admissions and registration, data processing and scheduling, housing and food services, career counseling and placement, college unions and student activities, the sources of financial aid, fraternities and sororities, intramural athletics and other programs.

SPS 528 Internship in Student Personnel Services 2-4 s.h.

The internship provides practical experience in the following areas of student personnel service: Dean of Students, Dean of Men, Dean of Women, Housing Office, Admissions, Registration, Placement, Financial Aid, Student Union, and related areas. Participating staff will include representatives from the cooperating staff listed above.

SPS 529 Seminar in Student Personnel Administration 2 s.h.

This is a course designed to review in depth the problems and trends in the various areas of student personnel service. Research projects are required.

EDUCATIONAL PSYCHOLOGY

Anthony A. Angeloni, Chairman

William M. Bahn
 William E. Cutler
 Leonard B. DeFabo
 John J. Hays
 Isabel T. Helmrich

Oliver W. Helmrich
 William J. Leventry
 Bruce A. Meadowcroft
 Mildred N. Shank
 Joan R. Yanuzzi

I. School Psychologist Certification Program

The School Psychology program is designed for those individuals who are seeking Certification as Public School Psychologists in the Commonwealth of Pennsylvania. Candidates for admission to the Certification Program must have a Master's degree and an Instructional or Specialist certificate from an accredited institution. Individuals who have a Master's degree in Counseling, Special Education, Psychology, or related fields will have completed some requisite courses for the program. The curriculum is tailored to meet individual needs in terms of the background and attained skills of each candidate.

II. Certificate of Advanced Study in School Psychology

Indiana University of Pennsylvania will issue a Certificate of Advanced Study in School Psychology to those individuals who have completed a minimum of thirty hours and completed their certification program. The thirty hours include an internship of twelve semester hours. Forty-five clock hours are considered equivalent to one semester hour of internship.

Individuals who enter the Certification Program in School Psychology will be recommended for certification by Indiana University of Pennsylvania as a school psychologist when they have demonstrated a thorough mastery of required competencies.

III. Admission

Application for admission to the program is made to the Graduate Office. The candidate must be admitted to the Graduate School as a qualified student. The candidate must secure the School Psychology Application Packet, which includes specific admission procedures, from the Director, School Psychology Program, Davis 212, Indiana University of Pennsylvania, Indiana, Pa. 15701. Questions concerning the program should be addressed to the Director. Candidate must complete the application and arrange for the forwarding of references and transcripts to the Director for review. An adviser will be assigned and may be contacted at any time concerning the progress of the application or if the applicant has further questions. No course work may be scheduled without the adviser's approval.

The Graduate Record Examination, including Psychology, must be taken by all candidates prior to final approval by the School Psychology Committee. Tentative approval is given at initial entry and final approval after taking four approved semester hours.

Candidates will be selected on the basis of background and experience record, letters of recommendation, personal interview, and revealed potential as a School Psychologist and professional in education.

Course Selections

- ° Courses marked with an asterisk are required, unless waived by the School Psychology Committee, and are representative of a minimal program designed to develop competencies of a Public School Psychologist.
- (+) Items marked with a (+) are restricted and available only to approved candidates in the School Psychology Program.

AREA I FOUNDATIONS

(Minimum—6 s.h.)

Required:

°Foundations (one course)		2 s.h.
FnEd	511 Historical Foundations of Education	2 s.h.
FnEd	512 Philosophical Foundations of Education	2 s.h.
FnEd	513 Social Foundations of Education	2 s.h.
°Grad	515 Elements of Research	2 s.h.
°Grad	516 Statistical Methods I	2 s.h.

Electives:

EdPsy	501 Seminar in Special Topics in Educational Psychology	2 s.h.
Grad	517 Statistical Methods II	2 s.h.
Grad	550 Thesis	2 s.h.

AREA II PROFESSIONAL SPECIALIZATION

(Minimum—24 s.h.)

Required: (Minimum—18 s.h.)

°EdPsy	506 Advanced Educational Tests and Measurements	2 s.h.
°EdPsy	521 Diagnosis and Remediation of Learning Disabilities for Educational Specialists	2 s.h.
°EdPsy	532 Studies in Pupil Adjustment (or)	2 s.h.
Psy	540 Advanced Mental Hygiene	2 s.h.
°Approved	Developmental Psychology Elective	2 s.h.
EdPsy	572 Advanced Psychology of Childhood Education	2 s.h.
EdPsy	573 Advanced Psychology of Adolescent Education	2 s.h.
°EdPsy	576 Advanced Studies in Behavior Problems	2 s.h.
°Psy	531 Psychology of the Exceptional Child	2 s.h.
°Psy	533 Psychology of Personality	2 s.h.
°Psy	534 Abnormal Psychology	2 s.h.
°Approved	Guidance Elective	2 s.h.
CnEd	531 Philosophy and Principles of Guidance	2 s.h.
CnEd	535 Study of Individual—Case Studies	2 s.h.
CnEd	537 Interviewing Techniques	2 s.h.

Approved Electives: (Minimum—6 s.h.)

(Other Electives may be approved by the School Psychology Committee)

EdPsy	502 Advanced Educational Psychology	2 s.h.
EdPsy	518 Interpretation of Psychological Tests for Reading Specialists	2 s.h.
Psy	538 Psychology of the Gifted Child	2 s.h.
Psy	539 Psychology of the Mentally Retarded Child	2 s.h.
Ed	522 Principles and Practice in Speech Improvement	2 s.h.
El	511 The Teaching of Reading in the Secondary School	2 s.h.
El	531 Curriculum Problems in Elementary Education	2 s.h.
Spe	520 Curriculum and Methods (Elementary)	2 s.h.
Spe	521 Curriculum and Occupational Education (Secondary)	2 s.h.
Spe	522 Orientation to Rehabilitation	2 s.h.
Spe	530 Organization and Administration of Programs for Exceptional Children	2 s.h.
Spe	535 Guidance and Adjustment	2 s.h.
Spe	565 Education of Children with Social and Emotional Maladjustments	2 s.h.
Soc	562 Deviant Behavior	2 s.h.
Soc	563 Intergroup Relations	2 s.h.

AREA III PSYCHOMETRICS AND INTERNSHIP

(Minimum—30 s.h.)

Required:

°EdPsy	511 Introduction to Educational Specialists	2 s.h.
(+)°EdPsy	560 Human Relations and Communications in Education	2 s.h.

(+)*EdPsy	512	Individual Psychometrics and Clinical Evaluation I, Binet Scale	2 s.h.
(+)*EdPsy	513	Individual Psychometrics and Clinical Evaluation II, Wechsler Scales	2 s.h.
(+)*EdPsy	514	Individual Psychometrics and Clinical Evaluation III, Special Clinical Tests	2 s.h.
(+)*EdPsy	565	Seminar in Problems of School Psychologists	2 s.h.
(+)*EdPsy	550	Clinical Practicum	12-14 s.h.
(+)*EdPsy	562	Counseling and Psychotherapy	2 s.h.
(+)*EdPsy	563	Introduction to Projective Techniques for School-Age Children	2 s.h.
Approved Electives			0-2 s.h.
(+)	EdPsy	551 Advanced Clinical Practicum	2 s.h.
(+)	EdPsy	564 Seminar in Advanced Projective Techniques for School-Age Children	2 s.h.
Electives Listed in Area I and II			

Course Descriptions

EdPsy 501 Seminar in Special Topics in Educational Psychology 2 s.h.

Prerequisite: Education Major

This course is designed for those students who wish to do independent research in special areas.

EdPsy 502 Advanced Educational Psychology 2 s.h.

Prerequisite: Education Major

An upward extension of Educational Psychology with a systematic review of current research and learning theory with emphasis on classroom application.

EdPsy 506 Advanced Educational Tests and Measurements 2 s.h.

Prerequisite: Education Major

A course which emphasizes an understanding of the various evaluation instruments and the use and interpretation of the information and test results as related to educational problems in the classroom.

EdPsy 511 Introduction to Educational Specialists 2 s.h.

Prerequisite: Education Major

A course that explores the duties and responsibilities of the various professional positions in the schools other than classroom teaching.

**EdPsy 512 Individual Psychometrics and Clinical Evaluation I
Binet and Cattell Scales** 2 s.h.

Prerequisite: EdPsy 511—For approved School Psychologist candidates

Theoretical concepts of individual psychometric testing and professional competency in administration, scoring, and basic interpretations of Binet and related scales of intelligence.

**EdPsy 513 Individual Psychometrics and Clinical Evaluation II
Wechsler Scales** 2 s.h.

Prerequisite: EdPsy 512—For approved School Psychologist candidates

Theoretical concepts of individual psychometric testing and professional competency in administration, scoring, and basic interpretation of the Wechsler Scales.

**EdPsy 514 Individual Psychometrics and Clinical Evaluation III
Special Clinical Tests** 2 s.h.

Prerequisite: EdPsy 512—For approved School Psychologist candidates

Skill is developed with Merrill-Palmer, Bender Gestalt, Vineland Social Maturity, Peabody Picture Vocabulary, Van Alstyne, Goodenough, Draw-A-Man, Wide Range Achievement and other pertinent tests.

**EdPsy 518 Interpretation of Psychological Tests for the
Reading Specialists** 2 s.h.

Prerequisite: Education Major

A course designed to provide the individual with the information necessary to understand, evaluate, and interpret the results of psychological tests accurately and meaningfully.

EdPsy 521 Diagnosis and Remediation of Learning Disabilities 2 s.h.
Prerequisite: Education Major

A course designed to help individuals recognize and diagnose a child's learning abilities and specific disabilities; understand the remediation process; and be able to make meaningful judgments.

EdPsy 532 Studies in Pupil Adjustment 2 s.h.
Prerequisite: Education Major

The course considers the problems of human adjustment in relation to causative factors and explores the dynamics of personal and interpersonal relationships.

EdPsy 550 Clinical Practicum 2-12 s.h.
Prerequisite: EdPsy 513, 514—For approved School Psychologist candidates

Extensive supervised experiences in psychometric, diagnostic, therapeutic and remediation techniques and processes. Forty-five clock hours shall be equivalent to one semester hour.

EdPsy 551 Advanced Clinical Practicum 2-6 s.h.
Prerequisite: EdPsy 550—For approved School Psychologist candidates

Clinical and field experience with severely mentally and physically handicapped and emotionally disturbed children. Forty-five clock hours shall be equivalent to one semester hour.

EdPsy 560 Human Relations and Communications in Education 2 s.h.
Prerequisite: EdPsy 511—For approved School Psychologist candidates

Development of competencies in the area of communication with children, teachers, administrators, supervisors, parents, agencies, and other disciplines.

EdPsy 561 Seminar in Interdisciplinary Coordination and Communication 2 s.h.
Prerequisite: Education Major

Functions, duties and services provided by the many different agencies of the community who provide services for children, parents, and educators.

EdPsy 562 Counseling and Psychotherapy 2 s.h.
Prerequisite: Education Major

A systematic study of the major techniques of psychotherapy with emphasis given to adaptations to children and the ethics and limitations.

EdPsy 563 Introduction to Projective Techniques for School-age Children 2 s.h.
Prerequisite: EdPsy 550—For approved School Psychologist candidates

An introduction to various projective techniques currently used.

EdPsy 564 Seminar in Advanced Projective Techniques for School-age Children 2 s.h.
Prerequisite: EdPsy 563—For approved School Psychologist candidates

Continued application and skill development of projective techniques giving specific administration techniques with interpretation of data.

EdPsy 565 Seminar in Problems of School Psychologists 2 s.h.
Prerequisite: EdPsy 550—For approved School Psychologist candidates

Discussion and direct attack on current problems confronting school psychologists giving some solutions and/or alternatives.

EdPsy 572 Advanced Psychology of Childhood Education 2 s.h.
Prerequisite: Education Major

The course studies the relationship which physical, social, emotional, and intellectual development have on the theory and practice of childhood and pre-adolescent education.

EdPsy 573 Advanced Psychology of Adolescent Education 2 s.h.

Prerequisite: Education Major

This course is concerned with the study of the significant characteristics and behavior of adolescents with emphasis on developing an understanding of the relationship these factors have for educational problems which occur during this period of development.

EdPsy 576 Advanced Studies in Behavior Problems 2 s.h.

Prerequisite: Education Major

The course explores the behavior problems encountered in classroom situations and gives causes, characteristics and some remedial techniques.

EdPsy 578 Advanced Seminar in Learning Problems 2 s.h.

Prerequisite: Education Major

This course explores learning theories and educational application in working with learning problems in the classroom.

ELEMENTARY EDUCATION

Ralph M. Glott, Chairman

Edward R. Mott, Director of Graduate Studies

Ronald L. Baker	Jack Kuhns
Alberta R. Dorsey	P. David Lott
Joseph A. Kazamek	Donald C. McFeely
Robert L. King	James B. Reilly
Betty Davis	George D. Zepp

The Elementary Education Master's curriculum is designed to assist a student to broaden or strengthen his background in academic areas and in professional education. If courses are carefully selected, some specialization is possible in areas such as language arts, social studies, math, or science. A student may use much freedom to design his own program.

At the Master of Education level an adviser is usually not selected until the student has identified a topic for research.

All graduate students in elementary education should schedule the elementary education section of Grad 515, Elements of Research. This course should be taken as one of the first courses in graduate studies.

In order to avoid scheduling difficulties each student should outline his graduate program and have it approved by the Director of Graduate Studies in Elementary Education. This outline should be approved prior to starting graduate studies.

Acceptance into the Graduate School permits a student to take course work in a department. If a student wishes to become a degree candidate, he must complete the Application to Candidacy form and forward this form to the Graduate School after having successfully completed six hours of course work in the department.

Advanced graduate students please refer to the section on the Doctor of Education degree.

MASTER OF EDUCATION DEGREE IN ELEMENTARY EDUCATION

Students working toward a Master's degree in Elementary Education should complete thirty hours of work in accordance with the following divisions:

I. Professional Studies—select a minimum of twelve (12) semester hours. Course work may be selected from a number of courses including the following:

LRes	500	Seminar in Learning Resources	2 s.h.
Grad	515	Statistical Methods I	2 s.h.
El	500	Basic Foundations of Reading Instruction	2 s.h.
El	501	Diagnosis and Remediation of Reading Disabilities	2 s.h.
El	531	Curriculum Problems in Elementary Education	2 s.h.
El	541	Special Problems in Elementary Social Studies	2 s.h.
El	542	Mathematics in the Elementary School	2 s.h.
El	543	Resource Materials in Elementary Science	2 s.h.
El	544	Recent Trends in Elementary Language Arts	2 s.h.
El	545	Experimental Studies in Art Education	2 s.h.
El	546	Modern Procedures and Skills in Elementary Music	2 s.h.
El	547	Resource Material in Children's Literature	2 s.h.
El	548	Creativity and the Elementary School Child	2 s.h.
El	550	The Community and the Elementary School	2 s.h.
El	551	Recent Innovations in Elementary Education	2 s.h.
El	552	Evaluating the Elementary School	2 s.h.

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| El | 553 | Supervision and Improvement of Instruction
in the Elementary School | 2 s.h. |
| El | 554 | Administration of the Elementary School | 2 s.h. |
| El | 555 | Recent Trends in Human Development
and Learning | 2 s.h. |
| *El | 577 | Supervised Internship | 3-6 s.h. |
| *El | 578 | Seminar in Elementary Education Internship | 3-6 s.h. |
| *El | 579 | Independent Study in Elementary Education | 3 s.h. |
| *El | 580 | Seminar in Advanced Research | 3 s.h. |
| Psy | 531 | Psychology of the Exceptional Child | 2 s.h. |
| Psy | 532 | Studies in Pupil Adjustment | 2 s.h. |
| Psy | 540 | Advanced Mental Hygiene | 2 s.h. |
- *to be scheduled by doctoral candidates only with permission.
- II. General Studies—Courses in this area should be selected after consulting with the Director of Graduate Studies in Elementary Education. Courses in professional studies should not be selected in this area.
- III. Foundations of Education—two (2) semester hours of work to be selected from the following courses:
- | | | | |
|----|-----|--|--------|
| Ed | 511 | Historical Foundations of Education | 2 s.h. |
| Ed | 512 | Philosophical Foundations of Education | 2 s.h. |
| Ed | 513 | Social Foundations of Education | 2 s.h. |
- IV. Research Requirement—Either a research project or a research thesis will be required to satisfy the research requirement. A research thesis will permit a student to receive graduate credit (2-4 hours) toward the Master's degree. The student should schedule Grad 550, Thesis, during the semester in which the thesis is being written. Grad 550 may be scheduled from 2 to 4 semester hours. If a project is selected to meet the research requirement, no graduate course needs to be scheduled and no graduate credit is received.
- V. Research Techniques—The following course is required: The Elementary Education Section of Elements of Research, Grad 515 (2 s.h.) should be scheduled early in the student's program.

PROGRAM IN EARLY CHILDHOOD EDUCATION

For those who wish to specialize in Early Childhood Education, a program of studies is designed to provide educational experiences which meet the needs of persons seeking competencies and subsequent certification toward Early Childhood Education Specialist. Afternoon, evening, Saturday, and summer session courses are offered for those students who are employed full-time in the education profession.

PROGRAMS IN READING

The curricula in the programs in Reading are designed to provide educational experiences which meet the needs of persons seeking competencies and subsequent certification in Reading. The curricula are intended to provide opportunities for a comprehensive educational experience and to be sufficiently flexible to allow for specialization in a specific area or level of interest in a field within Reading.

The Indiana University of Pennsylvania offers a degree at the master's level in its program of Reading. In addition, the program's curricula are designed to permit students to fulfill the requirements for certification as: (1) Reading Specialists, (2) Reading Supervisors.

The programs in Reading provide a variety of opportunities for students to complete certification and degree requirements. Evening and summer courses are provided for those students who are employed full-time in the education professions.

Courses for completion of both degree and certification programs are as listed.

Reading Specialist

Students seeking a Master of Education Degree in Reading and who desire certification as a Reading Specialist are required to complete the requirements outlined below. A minimum of 30 semester hours is required for the degree and certification as Reading Specialist. Some students may have to schedule additional semester hours to reach the required level of competency. All courses scheduled must have the written approval of his Reading adviser.

MASTER OF EDUCATION DEGREE IN READING

I. Reading and Related Subject Matter		Hours Required 12
°El	500 Basic Foundations of Reading Instruction	2 s.h.
°El	501 Diagnosis and Remediation of Reading Disabilities	2 s.h.
°El	502 Reading Practicum: Diagnostic Case Studies	2 s.h.
°El	503 Reading Practicum: Remedial Case Studies	2 s.h.
El	507 Instructional Materials in Reading for Children and Youth	2 s.h.
El	508 Reading in the Content Areas	2 s.h.
El	511 The Teaching of Reading in the Secondary School	2 s.h.
El	547 Resource Materials in Children's Literature	2 s.h.
II. Educational Psychology		Hours Required 4
°EdPsy	502 Advanced Educational Psychology	2 s.h.
°EdPsy	506 Advanced Educational Tests and Measurements	2 s.h.
°EdPsy	518 Interpretation of Psychological Tests for the Reading Specialist	2 s.h.
III. Psychology		Hours Required 6
°Psy	531 Psychology of the Exceptional Child	2 s.h.
Psy	534 Abnormal Psychology	2 s.h.
Psy	535 Differential Psychology	2 s.h.
Psy	538 Psychology of the Gifted Child	2 s.h.
Psy	539 Psychology of the Mentally Retarded	2 s.h.
Psy	540 Advanced Mental Hygiene	2 s.h.
IV. Educational Research		Hours Required 6
Grad	512 Thesis or Research Project	2 s.h.
Grad	515 Elements of Research	2 s.h.
Grad	516 Statistical Methods I	2 s.h.
V. Foundations of Education		Hours Required 2
Ed	511 Historical Foundations of Education	2 s.h.
Ed	512 Philosophical Foundations of Education	2 s.h.

°Required

Reading Supervisor

Students seeking certification as Reading Supervisors must complete the requirements for the Master of Education Degree in Reading, be eligible for a Level III certificate and earn 18 semester hours of course work selected from Reading Supervisor's Program of Studies below. Some students may have to schedule additional semester hours to reach the required level of competency. All courses scheduled must have the written approval of his Reading adviser.

I. Reading and Related Subject Matter		Hours Required 8
°El	504 Remediation of Severe Reading Disability	2 s.h.
°El	505 Administration and Supervision of Reading Programs	2 s.h.

°El	506	Practicum in Advanced Diagnosis and Remediation of Severe Reading Disability Cases	2 s.h.
El	513	Modern Concepts in Developmental Reading	2 s.h.
El	544	Recent Trends in Elementary Language Arts	2 s.h.
II. Educational Research			Hours Required 2
Grad	517	Research and Literature in Reading	2 s.h.
III. Curriculum and Supervision			Hours Required 4
El	531	Curriculum Problems in Elementary Education	2 s.h.
°El	553	Supervision and Improvement of Instruction in the Elementary School	2 s.h.
El	554	Administration of the Elementary School	2 s.h.
IV. Other Areas			Hours Required 4
Eng	512	American English Grammar	2 s.h.
Eng	544	Seminar in the Psychology of Language	2 s.h.
CnEd	531	Philosophy and Principles of Guidance	2 s.h.
Ed	522	Principles and Practice in Speech Improvement	2 s.h.
Ed	555	Advanced Human Development and Learning	2 s.h.
SpEd	565	Education of Children with Social and Emotional Maladjustments	2 s.h.
°Required			

Course Descriptions

El 500 Basic Foundation of Reading Instruction 2 s.h.

Study of reading from beginnings (readiness) through the principles, problems, techniques, and materials designed to foster two types of growth: (1) growth "in" reading as children develop skills, abilities, and habits which enable them to progress toward maturity in reading—i.e., as they become increasingly effective and skillful in this mode of communication and (2) growth "through" reading as children develop interests, attitudes and understandings which enable them to progress toward maturity in living—i.e., as their personal and social life is enhanced as a result of reading.

El 501 Diagnosis and Remediation of Reading Disabilities 2 s.h.

Prerequisite: El 500

This course discusses the general principles of diagnosis, types of diagnosis, specific approaches to diagnosis, utilization and examinations of group and individual tests, and methods and materials which may be used in the remediation of the disability.

El 502 Reading Practicum—Diagnostic Case Studies 2 s.h.

Prerequisites: El 500 and El 501

This practicum will give the enrollee the opportunity to put into practice the techniques of diagnosis he has learned in El 501. By preparing a case study on a hypothetical pupil and then on an actual pupil who has been referred to the clinic because of a reading disability, the graduate student will have the advantage of administering and interpreting a battery of tests, formal and informal, that will hopefully lead to specific recommendations for further testing, if appropriate, and remediation.

El 503 Reading Practicum—Remedial Case Studies 2 s.h.

Prerequisites: El 500, El 501, El 502

While enrolled in this practicum the student will have the opportunity of a previously written case study. The study will design and implement the program, select the appropriate learning materials, administer further diagnostic tests to determine additional problems if any, and make recommendations for further remediation.

El 504 Remediation of Severe Reading Disability Cases 2 s.h.

This course considers the scope of extreme disability reading cases, analysis and treatment. It includes: (1) primary and secondary classifications of reading difficulties, (2) specific patterns of syndromes of severe reading disabilities together with diagnosis and prognosis of them, and (3) specific treatment advocated for these disabilities.

El 505 Administration and Supervision of Reading Program 2 s.h.
Prerequisite: El 500

The role of the administrator and reading supervisor in reading programs will be studied. Programs will be designed to achieve different purposes: supervision of classroom teaching, creation of new developmental programs, parental and public relations, reorganizing of current programs, and survey of needs for program planning.

El 506 Practicum in Advanced Diagnosis and Remediation of Severe Reading Disability Cases 2 s.h.

This practicum is designed to provide an opportunity for each enrollee to work with students with severe reading disabilities under the supervision of especially trained university personnel. It is tailored to meet the individual needs of the enrollee. Activities will be planned to go into greater depth in diagnosis and/or remediation.

El 507 Instructional Materials in Reading for Children and Youth 2 s.h.

This course is designed to familiarize the student not only with the materials for teaching reading including basal reading series comprehension development materials, word attack materials, audio-visual materials, and mechanical devices, but also the basic issues underlying the selection and use of reading instructional materials for atypical learners in basic reading instruction and the content areas in K-12.

El 508 Reading in the Content Areas 2 s.h.

The emphasis of this course is on problems related to teaching students the reading and study skills specifically needed in each of the subject areas at the elementary and secondary school levels. Content teachers learn how to develop students' competence in these skills as part of their regular classroom instruction. Reading specialists study ways to help classroom teachers be more effective in this kind of instruction.

El 511 The Teaching of Reading in the Secondary School 2 s.h.

For secondary teachers. The developmental reading program in secondary schools; use of reading in various curriculum areas, appraisal of reading abilities, and techniques and materials for helping reluctant and retarded readers.

Grad 512 Thesis or Research Project 2 s.h.

Individual study. The thesis or research project may be an organized scientific contribution or a comprehensive analysis of theory and practice in a specific area.

El 513 Modern Concepts in Developmental Reading 2 s.h.

This course makes an intensive study of the up-to-date methods and materials required to teach developmental reading in the public schools. This course provides an understanding in depth of reading for prospective Reading Supervisors.

El 517 Research and Literature in Reading 2 s.h.

The course is designed to familiarize the student with the major research studies done in reading. Specifically, each student will study the following types of research in the field of reading:

1. Historical
2. Descriptive survey
3. Case study
4. Experimental

EdPsy 518 Interpretation of Psychological Tests for the Reading Specialist 2 s.h.

This course is designed for the graduate student enrolled in curriculums for preparation as Reading Specialists in the public schools to understand, evaluate, and interpret the results of psychological tests accurately and meaningfully.

This objective would be achieved by the use of the following approaches:

1. through an understanding of the principles of text construction.
2. through psychological knowledge of the behavior being measured.
3. through familiarity with the field of available testing instruments.

El 531 Curriculum Problems in Elementary Education 2 s.h.

The curriculum will be studied in relation to local needs and resources. Special attention will be given to contemporary forms of organization and procedures for curriculum development. A student will concentrate his studies on a specific problem of area interest.

El 541 Special Problems in Elementary Social Studies 2 s.h.

The content of the social studies in the elementary school as it contributes to world understanding and the American cultural heritage will be included in this course. Each student will concentrate his studies on a special problem or area of interest. (Mott)

El 542 Mathematics in the Elementary School 2 s.h.

An overview of the development of mathematics as a part of the elementary school curriculum will be presented. It will emphasize curriculum development based upon research in mathematics, special problems in the teaching of mathematics and the literature which should be known to a teacher of mathematics. Prerequisite: The Teaching of Mathematics. (Mathematics Staff)

El 543 Resource Materials in Elementary Science 2 s.h.

This course is designed to give the elementary teacher experience with the literature, equipment, and materials used in teaching science in the elementary school. References dealing with experiments, demonstrations, and identification of plants and animals will be studied. Experiments and demonstrations will be emphasized. Science kits will be prepared which contain basic equipment that may be used in classroom situations. Field trips will be taken to observe materials in real life situations. Given in summer school only. (Science Staff)

El 544 Recent Trends in Elementary Language Arts 2 s.h.

This course will deal with trends, problems, and recent contributions of research in the language arts. Areas will include elementary English, spelling, penmanship, and children's literature. Each student will concentrate his studies on a special problem or area of interest.

El 545 Experiment Studies in Art Education 2 s.h.

Teachers will undertake art experiences in various media as they are adapted to the provision of art experiences for the child. Emphasis will be placed on the stages of growth, type of motivation, and ways of administering stimuli. The class will study the exceptional child to learn to recognize and encourage evidences of art potential as well as wholesome self-expression. (Art Staff)

El 546 Modern Procedures and Skills in Elementary Music 2 s.h.

The purpose of this course is to provide the elementary teachers with new developments and techniques recommended for music education. (Music Staff)

El 547 Resources Materials in Children's Literature 2 s.h.

This course will be concerned with the selection and evaluation of children's literature as a resource for teaching and learning. Although traditional and modern literature in prose and poetry will be considered, much emphasis will be given to non-fiction. Ways will be studied to use these materials in the elementary school program.

El 548 Creativity and the Elementary School Child 2 s.h.

This course will explore ways to uncover creative abilities in children and techniques to direct these energies in the classroom situation. The role of the teacher as the developer of these abilities will be stressed.

El 550 The Community and the Elementary School 2 s.h.

Included in this course will be principles and practices of developing and maintaining good school-community relationships, communications media, and the use of lay personnel. The use of resource persons and the community itself as aids to enrichment will be reviewed.

El 551 Recent Innovations in Elementary Education 2 s.h.

Students will study newer trends in classroom procedure, equipment, and materials as well as problems involved in the improvement of instruction. Whenever possible laboratory sessions will be held to demonstrate and use recently developed materials. Field trips may be used.

El 552 Evaluating the Elementary School 2 s.h.

This course will be concerned with the evaluation of the elementary school, its curriculum, the professional and non-professional staff, and the community as an educational agency. Emphasis will be on self-evaluation. Evaluation will be directed in terms of established educational objectives.

El 553 Supervision and the Improvement of Instruction in the Elementary School 2 s.h.

This course will deal with principles and techniques of supervision in the elementary school. Objectives of the program and the role of the supervisor must be defined. The personal help of the supervisor and the management of equipment and personnel will aim toward the improvement of instruction.

El 554 Administration of the Elementary School 2 s.h.

Principles and techniques of elementary school administration will be studied. Leadership qualities, training and experience background, and human relationship qualities will be reviewed. The administrator will be viewed as a leader of teachers, children, non-professional staff and the community to develop and maintain the best educational plant possible.

El 555 Recent Trends in Human Development and Learning 2 s.h.

This course will be concerned with the recent literature and experimental works in the field of learning. Studies will be limited to the pre-school and elementary school child. Characteristics of the learner, the learning situation and motivation will be stressed.

El 560 Early Childhood Child Study Techniques and Resources 2 s.h.

This course is designed to help students become familiar with the scientific method of studying children between the ages of three through eight years, inclusive. Through studying one child in depth, the student learns to observe, record, and analyze pertinent information in order to make multiple hypotheses, and to suggest ways to help children toward positive self-development. It is the responsibility of the student to select and have one child available as a subject for in-depth study.

El 561 Early Childhood Philosophy and Principles 2 s.h.

This course will introduce the student to the philosophy and historical background of pre-school through primary education (ages three through eight years, inclusive) and their influences on current children programs and research.

El 562 Early Childhood Curriculum and Materials 2 s.h.

A study of the curriculum patterns of early childhood (ages three through eight years, inclusive) programs, materials available, and program planning for optimal development of children and space available. Current programs, their financial sources, and budgeting procedures will be included.

El 563 Early Childhood Assessment Tools and Evaluation Techniques 2 s.h.

The course is designed to introduce tests for the assessment of the young child (ages three through eight years, inclusive) in the areas of

perception, concept development, self-inventories, general intellectual ability, and readiness. Several achievement and diagnostic tests of academic ability will be studied. The student will have an opportunity to test, evaluate, and implement a program for the young child on a general introductory level not requiring in-depth study.

EI 564 Early Childhood Field Study Experiences 2 s.h.

A course designed to give direct observation and participation of the teaching in nursery-kindergarten, federal, state, or local supported early childhood programs. Seminar sessions will be designed to study appropriate programs with immediate application in a classroom. Close supportive relationships with parents and community will be stressed with a program devised suitable to that classroom.

EI 577 Supervised Internship 3-6 s.h.

The students selected for this program receive continuing individualized guidance and supervision from an intern consultant during their semester of internship.

(Registration only by permission of Graduate Committee)

EI 578 Seminar in Elementary Education Internship 3-6 s.h.

Consultants who are specialists in their fields will be invited to discuss with interns problems related to their intern teaching or work experience.

(Registration only by permission of Graduate Committee)

EI 579 Independent Study in Elementary Education 3 s.h.

Students will select one or more topics which are of critical importance in Elementary Education and will meet the staff members for independent reading, study, analysis, and evaluation.

(Registration only by permission of Graduate Committee)

EI 580 Seminar in Advanced Research 3 s.h.

Enrollment in this course will be by special application only and will be limited to the advanced post-master's student. Most work will be on an individual or small seminar basis with staff and will be concerned with readings, research, and evaluation of proposed research.

Internship In Elementary Education

For a limited number of Elementary Education graduates Indiana University of Pennsylvania is providing an internship program leading to the Master of Education degree.

The participant must first complete a Bachelor's degree in Elementary Education and hold a teaching certificate. He will enroll for a full summer of graduate study. During the following academic year he will spend one semester as a full-time professional teacher in a selected school system; during the other semester he will be a full-time graduate student on the Indiana campus. The second summer will be spent in completing the Master of Education requirements.

While the teacher is employed as a full-time professional teacher in a selected school system, he will have conferences on his professional work progress with a specialist from the University in which there will be a review of his work as a teacher. The (intern) teacher will be paid by the school district for one-half year at the usual rate for a professional teacher in that position.

The course work taken during the two summer sessions and the one full semester will meet the requirements for the Master of Education degree in elementary education and will fulfill permanent certification requirements.

For information regarding the fifth-year internship program for the Master's degree in elementary education, interested persons should write to Chairman of the Elementary Education Department, Indiana University of Pennsylvania, Indiana, Pennsylvania 15701.

THE DOCTORATE IN ELEMENTARY EDUCATION

Admission to the Program of Advanced Graduate Studies

Admission must be secured before a student may proceed further toward the Ed.D. degree. Full admission may be granted only to an applicant who has achieved a grade average of "B" (3.0) during his junior and senior undergraduate years in his major area and in all courses taken, and who has received a minimum total score of 1000 on the Graduate Record Aptitude Test (verbal and quantitative).

Departmental Screening

After admission to the Graduate School and after the completion of fifteen hours of graduate work at Indiana University of Pennsylvania beyond the Master's degree, the doctoral aspirant must apply for departmental screening. Through screening the major department makes a decision to approve or disapprove further efforts by the student toward completion of the doctorate.

Plan of Study

Following a favorable screening by the major department the student should submit a Plan of Study to the major adviser. Forms for this purpose are available in the Office of the Director of Graduate Studies in Elementary Education.

Change in Plan of Study

Any changes from the original plan must be approved in writing by the major adviser and the Director of Graduate Studies in Elementary Education. Forms for this purpose are available in the latter's office.

Doctoral Committee

The doctoral committee is appointed by the Graduate Dean upon recommendation of the major department. The Plan of Study is then submitted for approval. This committee serves throughout the student's doctoral program as an examining body and for consultation and help during the research and preparation of the dissertation.

Internship Requirement

Ordinarily, an internship will be required for a minimum of one semester. This internship will provide first-hand experience in an educational program outside of the type of institution in which the student previously worked. Students with extensive leadership experience may be assigned short internships during which they will be expected to carry out research projects in their special interest areas.

Arrangements for a variety of internship might be made with industry, school systems, or with other agencies, on an individual basis. The nature of the internships must be consistent with requirements and interests in cooperating educational institutions.

The internship experiences must be in harmony with the student's program and job goals. The student must be assigned specific tasks and be supervised by a regular staff member of the university, preferably his major adviser or a member of his doctoral advisory committee.

Each intern will maintain a log or diary of his activities which will be reviewed and analyzed for the purpose of evaluating the internship experience.

Candidacy

Prior to admission to candidacy, the student will be expected to prepare and secure committee approval of a prospectus describing his proposed internship experience(s). The prospectus should clearly state, for each experience:

- A. The name of the institution or organization in which experience is sought.

- B. The name of persons who will assign tasks and supervise the intern's performance.
- C. The period of time to be spent in this experience.
- D. A brief definition of the learning goals to be sought during this experience, including
 1. Cognitive goals—knowledges the intern expects to acquire
 2. Psycho-motor goals—skills the intern expects to develop
 3. Affective goals—attitudes, values and beliefs the intern expects to change or alter as a result of the internship experience
- E. The means by which the intern expects to achieve the above goals. (Activities and projects with which he will be involved and persons with whom he will come in contact.)
- F. The evaluative procedures which might be employed to determine whether the goals have been achieved.

Comprehensive Examinations—Written

After filing the Plan of Study, receiving notification of the appointment of a committee, and the completion of forty-five semester hours of the program (including the Master's degree), the student may apply for written examinations. Approval of the major professor is required. Application forms are available in the Office of the Graduate Dean and must be filed at least one month before the scheduled testing date as noted in the calendar of the Annual Bulletin.

The comprehensive examinations are administered by the major department; both major and related fields are represented.

For the degree in Elementary Education the major adviser submits a report after consultation with faculty representatives from the related areas who submitted questions. The committee will notify the student and the Graduate Dean of the outcome of the written examinations.

Comprehensive Examinations—Oral

After the written comprehensive examination is passed the oral examination is scheduled by the major adviser. The oral comprehensive examination is conducted by the student's doctoral committee.

Research Requirements

Certain research requirements must be satisfied before the preliminary plan for dissertation research is presented to the doctoral committee. Any one of the following form options may be used to satisfy research requirements:

- 1) Two courses in research methods plus two graduate courses in statistics.
- 2) Two graduate courses in statistics, one course in computer science and one course in research methods.
- 3) One foreign language (6 hours) plus one course in research tools and one graduate course in statistics.
- 4) Three graduate courses in statistics and one course in research methods.

Review of Research Proposal

The purpose of the dissertation proposal meeting is explained in the following statement addressed to doctoral committee members:

The purpose of the meeting is to approve or disapprove the dissertation proposal, to offer guidance to the student and to make comments, suggestions, and recommendations which the committee feels will assist him.

The committee is expected to reach a clear-cut decision to approve or disapprove the proposal study as presented. If the proposal is accepted, no further meeting of the committee is necessary. If the alterations required by the doctoral committee are so basic or extensive as to necessitate another committee meeting or further approval by members

of the committee, the action recommended should be to disapprove the proposal. If the proposal is disapproved, a subsequent meeting of the student and the full committee is required.

The preliminary plan for doctoral research must be approved by the major professor before a request for a committee meeting may be submitted. The student should deliver not later than two weeks in advance of the scheduled meeting one copy of the proposal to each of his doctoral committee members.

Approval of the committee signifies that, in its opinion, the candidate is ready to begin full-time research on the dissertation without extensive revision.

When the preliminary plan is presented to the committee, the student should be thoroughly familiar with his topic and its relationship to existing research. His knowledge of bibliography in his area of study should be sophisticated and should be so reflected in the proposal.

Tests, scales, and other instruments employed in the study should have some demonstrated reliability and validity. Where such instruments are incidental to and constructed especially for the proposed research, supporting information should be provided in the dissertation proposal.

Dissertation Review Meeting

When the dissertation is completed it must be submitted to the Office of the Graduate Dean. One unbound copy must be supplied each member of the advisory committee at least two weeks before the final review. During these two weeks the Graduate Dean and members of the doctoral committee read the dissertation.

The final review is of the dissertation and of the general area to which it relates. Approval by the committee signifies that the dissertation is ready for publication without alteration. In review the committee will be concerned with ideas and the candidate's defense of same. In addition, the candidate is responsible for form, style, structure and technical accuracy. It is the candidate's responsibility to make certain that the dissertation is accurate in every detail prior to submitting the dissertation for review.

SUMMARY FOR PROCEDURES FOR DOCTORATE IN ELEMENTARY EDUCATION

Procedure	Time Element
1. Apply for admission to the Graduate School and for permission to enroll for advanced graduate studies.	After completion of the Master's degree
2. Apply for departmental screening, which serves as an evaluation of candidacy.	Before completion of 45 graduate hours
3. Channel program of studies toward either the Doctoral degree or the specialist's program.	At completion of 45 graduate hours
4. If the specialist's program is chosen, select courses in area of concentration.	45-60 graduate hours
5. If admitted to doctoral studies, present Plan of Study to the major adviser. The doctoral committee approves Plan of Study.	After departmental screening
6. Submit internship prospectus.	After committee is appointed
7. Apply for comprehensive examinations.	45-60 graduate hours
A. Schedule written comprehensive examination.	
B. Schedule oral comprehensive examination.	After written examination is passed

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|---|---|
| 8. Complete research skill requirements. | Before submission of dissertation proposal |
| 9. Schedule dissertation meeting for approval or rejection of proposal. | After comprehensive examinations |
| 10. Schedule final review of dissertation and internship experience. | Send one copy to Dean's office two weeks before meeting |
| 11. Apply for graduation. | Two months prior to nearest commencement following acceptance of dissertation |

THE SPECIALIST CERTIFICATE PROGRAM IN ELEMENTARY EDUCATION

The specialist's certificate program requires two years of study beyond the Bachelor's degree and affords the student an opportunity to prepare in depth for a variety of positions in education.

The present policies of the Graduate School of the University require that students hold a Master's degree before applying for admission to the specialist's degree program. The specialist's degree, thus, requires a minimum of sixty semester hours of graduate credit beyond the Bachelor's degree or a minimum of thirty semester hours of credit beyond the Master's degree. The program outline that follows, therefore, assumes a student has completed the Master's degree program in elementary education in graduate credits earned from an accredited institution.

Specialist's Certificate Program will require sixty semester hours of graduate level work, including:

- a. Four courses (or eight hours) in Elementary Education Curriculum and Supervision.
- b. Four courses (or eight hours) in one special field of concentration.
- c. All students must schedule the course El 579—Independent Study in Elementary Education. In this course the student will prepare a paper on a practical aspect of education. The subject for this paper will be agreed upon by both the student and his departmental adviser.

The student, with the guidance of his adviser, will plan a program of courses designed to fit his particular purposes. Such courses will be selected from the total offerings of the University. The objective of students may be in one of the following:

- A. Course selection to build a special area of competency such as curriculum development, supervision or instructional improvement.
- B. Course selection to build two specialties such as indicated in A above.
- C. Course selection focused on preparation for a particular professional job such as curriculum coordinator, assistant superintendent in charge of instruction, or director of elementary education.
- D. Course selection intended to provide a broad base of curricular experience in curriculum and supervision (the generalist in this educational specification).
- E. Course selection for completing requirements for permanent certification in certain areas.

ENGLISH

Craig G. Swauger, Chairman	
William F. Grayburn, Director of Graduate Studies	
William W. Betts, Jr.	Harry Haldeman
Lorrie J. Bright	Jackson Heimer
R. Morrison Brown	Raymona E. Hull
Frank T. Como	Lawrence A. Ianni
David M. Cook	Dorothy F. Lucker
Harry E. Craig	John J. McManmon
Bob J. Curey	Margaret Omrcanin
Malcolm Day	Maurice L. Rider
James M. DeGeorge	Helena M. Smith
Robert W. Ensley	Ford H. Swigart
James R. Green	Raymond L. Thomas

A candidate for a Master's degree in English may choose a program leading to either the Master of Education or the Master of Arts. The choice will depend on the background of the candidate and his purpose in pursuing graduate study. Both programs share a common aim of increasing the candidate's knowledge of English language and literature and introducing him to the discipline of advanced study.

After a student is admitted to the graduate school he will be assigned an advisor who will consult with him about the scheduling of courses.

I. Research Requirements

Candidates for both the Master of Arts and the Master of Education degrees in English will enroll in Eng 510 (Bibliographical Methods in English—2 hrs.), as a first or a very early course in their degree programs.

A thesis is required of all Master of Arts candidates, who will register for from two to four (2-4) semester hours of Grad 550. The thesis proposal will be reviewed by a departmental committee assigned by the director of graduate studies. After approval, the candidate will write the thesis under the direction of his thesis committee chairman and present himself for an oral examination after it has been completed.

A Master of Education degree candidate may choose to satisfy the research requirement by a thesis under the same conditions as those for the Master of Arts degree, or he may choose to schedule four additional hours of course work and submit a Research Project approved by the Director of Graduate Research and a project chairman.

II. Subject Matter Concentration

The following list of courses will provide the content studies for programs in both the Master of Education and the Master of Arts degrees.

From this list the M.A. candidates will choose from eighteen to twenty-four (18-24) hours; the M.Ed. candidates will choose from sixteen to twenty (16-20) hours, depending on the options elected for research, professional studies, or related studies.

Courses numbered "600" are seminars designed for the student who has some experience in graduate study. Students working for the M.A. or M.Ed. degree are encouraged to schedule "600" courses, on approval of the instructor, to help meet subject-matter requirements. Seminars may be scheduled more than once, because subject matter will change with each offering of the course.

Eng	512	American English Grammar	3 s.h.
Eng	513	The English Language from the Beginnings to 1500	3 s.h.
Eng	514	The English Language since 1500	3 s.h.
Eng	515	Shakespeare I	3 s.h.
Eng	516	Shakespeare II	3 s.h.
Eng	517	Elizabethan Drama	3 s.h.
Eng	520	Old English Literature	3 s.h.
Eng	521	Modern European Fiction	3 s.h.
Eng	522	Chaucer	3 s.h.
Eng	525	The Early English Drama	3 s.h.
Eng	527	Restoration and Eighteenth Century Drama	3 s.h.
Eng	528	Milton	3 s.h.
Eng	532	Colonial American Literature	3 s.h.
Eng	534	Types of the Novel	3 s.h.
Eng	535	Criticism	3 s.h.
Eng	536	Middle English Ballads, Lyrics, and Romances	3 s.h.
Eng	537	Modern American Fiction	3 s.h.
Eng	539	The Metaphysical Poets	2 s.h.
Eng	540	Twentieth Century American Drama	3 s.h.
Eng	541	The Rise of American Regionalism	3 s.h.
Eng	543	The British Novel of the Eighteenth Century	3 s.h.
Eng	544	The Psychology of Language	3 s.h.
Eng	545	The Age of Pope	3 s.h.
Eng	546	The Age of Johnson	3 s.h.
Eng	547	Romantic Prose and Poetry	3 s.h.
Eng	548	Victorian Prose and Poetry	3 s.h.
Eng	551	Twentieth Century British Novel	3 s.h.
Eng	552	Twentieth Century British Drama	3 s.h.
Eng	553	The American Renaissance	3 s.h.
Eng	554	Contemporary American and British Poetry	3 s.h.
Eng	555	Realism in American Fiction	3 s.h.
Eng	556	Modern British Poetry	2 s.h.
Eng	557	Modern American Poetry	2 s.h.
Eng	561	Tragic Themes of Classic Drama	3 s.h.
Eng	562	Epic and Lyric Poetry of the Classical Period	3 s.h.
Eng	565	The Faust Literature	2 s.h.
Eng	567	Literary Britain	3-6 cr.
Eng	570	Major Writers: Hawthorne and Thoreau	2 s.h.
Eng	571	Major Writers: Faulkner and Hemingway	2 s.h.
Eng	572	Major Writers: Thomas Hardy	2 s.h.
Eng	573	Major Writers: Whitman	2 s.h.
Eng	574	Major Writers: Poe	2 s.h.
Eng	575	Major Writers: Henry James	2 s.h.
Eng	576	Major Writers: Joseph Conrad	2 s.h.
Eng	577	Major Writers: Emerson	2 s.h.
Eng	578	Major Writers: Edmund Spenser	2 s.h.
Eng	579	Major Writers: Alexander Pope	2 s.h.
Eng	580	Major Writers: Samuel Johnson	2 s.h.
Eng	581	Major Writers: Jonathan Swift	2 s.h.
Eng	582	Major Writers: Wordsworth and Coleridge	2 s.h.
Eng	583	Major Writers: Byron, Keats, and Shelley	2 s.h.
Eng	584	Major Writers: Tennyson and Browning	2 s.h.
Eng	585	Major Writers: Charles Dickens	2 s.h.
Eng	586	Major Writers: D. H. Lawrence	2 s.h.
Eng	587	Major Writers: W. B. Yeats	2 s.h.
Eng	588	Major Writers: G. B. Shaw	2 s.h.
Eng	589	Major Writers: Herman Melville	2 s.h.
Eng	590	Major Writers: Mark Twain	2 s.h.
Eng	591	Major Writers: Frost and Robinson	2 s.h.
Eng	592	Major Writers: T. S. Eliot	2 s.h.
Eng	593	Major Writers: Fitzgerald and Lewis	2 s.h.
Eng	600	Seminar in British Literature to 1500	3 s.h.

Eng	610	Seminar in British Literature— Renaissance (1500-1660)	3 s.h.
Eng	620	Seminar in Shakespeare	3 s.h.
Eng	630	Seminar in British Literature—Restoration and Eighteenth Century (1660 to 1800)	3 s.h.
Eng	640	Seminar in British Literature— Nineteenth Century (to 1870)	3 s.h.
Eng	660	Seminar in Modern British Literature (from 1870)	3 s.h.
Eng	670	Seminar in American Literature to 1870	3 s.h.
Eng	680	Seminar in Modern American Literature (from 1870)	3 s.h.
Eng	690	Seminar in Literary Criticism	3 s.h.
Eng	695	Seminar in Linguistics	3 s.h.
FL	521	Language and Society	2 s.h.

III. Special M.Ed. Requirements

In addition to satisfying the general policy for admission to the Graduate School, the M.Ed. candidate must possess a Pennsylvania Teacher's Certificate in English or its equivalent from another state.

Professional Studies

The M.Ed. candidate will take from two to six (2-6) hours from the following list of courses:

Eng	511	Seminar in the Teaching of English in the Secondary School	2 s.h.
Eng	550	Workshop in Play Production	6 s.h.
Eng	568	Teaching Composition in the Secondary School	2 s.h.
LRes	500	Seminar in Learning Resources	2 s.h.
Grad	516	Statistical Methods I	2 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.
Psy	532	Studies in Pupil Adjustment	2 s.h.

Foundations of Education

Two (2) semester hours of work must be selected from the following courses:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Special M.A. Requirements

Foreign Language

The candidate for the M.A. degree must show a proficiency in a single language besides English. This language may be one of the modern foreign languages or a classical language. The proficiency requirement is satisfied by acceptable undergraduate credit of 12 hours in the language or by satisfactory performance on an examination administered by the Foreign Languages Department at Indiana.

Related Studies

The M.A. candidate may apply a maximum of six hours in a single related field (such as history, philosophy, psychology or other areas approved by his advisor) toward satisfying his requirement of 18-24 hours of subject-matter courses (see II above).

Doctor of Philosophy

The program leading to the Doctor of Philosophy degree in English and American literature is designed for those who wish to teach at the

college or university level. A candidate for this degree is expected to acquire a broad knowledge in limited areas of study, and show through the completion of an acceptable dissertation the ability to conduct an independent investigation of a topic approved by the department. To become a candidate the applicant must meet all the Graduate School requirements for candidacy, as well as the special requirements of the English department. Admission to course work beyond the Master's degree does not constitute admission to candidacy for the Ph.D. program. No specific number of course credits entitles a student to the degree, but a minimum of sixty semester hours of credit, exclusive of research credits, must be earned beyond the Bachelor's degree. Applications for candidacy will be reviewed by a departmental candidacy committee after six hours of graduate credit have been earned beyond the Master's degree and before twelve hours have been completed. The applicant must pass a written candidacy examination based on a departmental reading list. In determining whether or not an applicant should be accepted as a candidate for the degree of Doctor of Philosophy, the committee will consider his performance on the candidacy examination, his scores on the Graduate Record Examination, and his performance in course work.

The foreign language requirements for Ph.D. candidates in English must be completed before the comprehensive examination. For those candidates who do not satisfy this requirement by course work, the Education Testing Service administers examinations in French, German, Russian and Spanish. All other language examinations (and in special cases those in French, German, Russian, and Spanish) are administered by the Foreign Languages Department of the University.

Candidates must demonstrate the capacity to teach effectively, either in the departmental teacher-internship program, or through other acceptable teaching experience.

After admission to candidacy, the candidate will be assigned to an advisory committee who will help the candidate prepare a plan of study for a comprehensive examination, which will be offered after the candidate has completed one and one-half years of study. The comprehensive examination will be taken on the recommendation of the advisory committee near the end of course requirements and before registering for Grad 650, dissertation credits. For the comprehensive examination the candidate will be permitted to select three areas of his choice from eight areas of examination: English Linguistics; British Literature—Beginnings to 1500; Renaissance (1500-1660); Restoration and 18th Century (1660-1800); 19th Century (1800-1870); Modern British Literature (from 1870); American Literature to 1870; Modern American Literature (from 1870). At least two graduate courses are required in each of the above designated areas which he does not select for his examination. Certain graduate courses will be required of all candidates.

On approval of the advisory committee, a candidate may take as many as fifteen graduate hours of course work in a minor field in support of his major research interest.

A complete description of the Ph.D. program in English can be obtained from the English Department or from the Graduate School.

COURSE DESCRIPTIONS

Eng 510 Bibliographical Methods in English 2 s.h.
This course offers the student practical training in the special methods and materials of research in English. Required of all majors in English and should be taken early in the program. (Staff)

Eng 511 Seminar in the Teaching of English in the Secondary School 2 s.h.
A seminar to explore the recent developments in the teaching of high school English. Open only to those holding a certificate to teach English. (Cook, Brown)

Eng 512 American English Grammar 3 s.h.

This course treats the phonology, morphology and syntax of present-day English, with the emphasis on the latter two. The various approaches to the analysis of English syntax are treated, and detailed consideration is given to problems of dialect and standards of correctness. (Green, Ianni, Craig)

Eng 513 The English Language from the Beginnings to 1500 3 s.h.

This course treats the phonology, syntax and lexicon of Old English and Middle English. Facsimile texts are examined as instances of the structure of earlier forms of the English language rather than as literary accomplishments. The purpose is to acquaint the student with earlier forms of the language and to provide background for study of the prose and poetry of Old and Middle English. (Green, Ianni)

Eng 514 The English Language since 1500 3 s.h.

This course presents the syntax and stylistics of the English language from Early Modern English to the present. The various rhetorical styles and theories that have dominated English prose at various periods are examined by the use of exemplary texts and the reading of the works of rhetorical theorists. Theory and performance in respect to diction, figurative language and sentence stylistics will be explored. (Green, Ianni)

Eng 515 Shakespeare I 3 s.h.

The material for this course is, in the main, the literary work of Shakespeare from the beginning of his career to 1600 (excluded are his early tragedies). In addition to the plays themselves (comedies and chronicles) and the scholarship on them, study is directed to the historical and theatrical influences that affected Shakespeare. (Swigart)

Eng 516 Shakespeare II 3 s.h.

This course concentrates primarily on Shakespeare's work from 1600 to his death, the period of the dark or problem comedies, his great tragedies and romances (his three earlier tragedies will be included). Includes advanced study in the scholarship on the plays and the Elizabethan milieu. (Swigart)

Eng 517 Elizabethan Drama 3 s.h.

The material for this course is the English drama, exclusive of Shakespeare, produced from the mid-sixteenth into the early seventeenth century. The rich variety of comedy and tragedy of the period is studied in the works of such writers as Lyly, Greene, Kyd, Marlowe, Dekker, and Jonson, against the historical and social background of the Elizabethan age. (Swigart)

Eng 520 Old English Literature 3 s.h.

This course explores the literary merit of the prose and poetry of the Anglo-Saxons. The universal and particular themes which attracted Anglo-Saxon poets are examined in both epic and lyric poetry, while the prose is considered as a reflection of the cultural values that underlie the English literary tradition. The examination of the Anglo-Saxon Literary accomplishment will include some attention to the prosody and diction of the artist, as well as a placement of that accomplishment within the framework of his times. Prerequisite: Eng 513, The English Language from the Beginnings to 1500. (Como)

Eng 521 Modern European Fiction 3 s.h.

This course offers an intensive study in translation of the major fiction writers of the twentieth century exclusive of British and American. The older generation—Proust, Gide, Kafka, Mann, and Unamuno—will be studied in relation to representatives of contemporary Europe such as Camus, Malraux, and Sartre. (Lucker)

Eng 522 Chaucer 3 s.h.

The major poetical works of Geoffrey Chaucer are studied primarily as literature but with considerable emphasis upon pronunciation, versification, language, and textual problems. (Rider)

- Eng 525 The Early English Drama** 3 s.h.
The development of the English drama from 900 to 1500, with attention to classical and indigenous influences on specific plays and types of plays, is studied. (Rider)
- Eng 527 Restoration and Eighteenth Century Drama** 3 s.h.
The British theatre from the Restoration period to Sheridan is studied in connection with the literary, historical, and social developments of the times.
- Eng 528 Milton** 3 s.h.
This course provides for intensive study in the major prose and poetry of John Milton, with attention to the religious and political controversies of the seventeenth century which are reflected in Milton's work. (Thomas, Rider)
- Eng 532 Colonial American Literature** 3 s.h.
This course provides a study of significant selections of American literature written prior to the 19th century and develops an understanding of the forces that shaped that literature and had considerable influence on a great portion of American literature that followed, down to the present time. (Cook, Omrcanin)
- Eng 534 Types of the Novel** 3 s.h.
Standards are established for such genres of the novel as the Historical Romance, the Novel of Ideas, the Novel of Manners, and Satiric Fantasy. English and American novels are read in several of these categories. (Ianni, Omrcanin)
- Eng 535 Criticism** 3 s.h.
This course confronts the student with the major statements of critical theory from Aristotle onward and places them within a historical context so that the student becomes aware of the evolution of literary standards in western culture. The aims of the course are both historical and aesthetic. (Ianni)
- Eng 536 Middle English Ballads, Lyrics, and Romances** 3 s.h.
The English and Scottish popular ballads and the lyrics are studied in reference to their origins, literary development, and social significance. The emphasis in the romances is upon the Arthurian legends. (Rider)
- Eng 537 Modern American Fiction** 3 s.h.
Trends in contemporary American fiction provide a basis for special studies in such figures as Dreiser, Anderson, Fitzgerald, Lewis, Dos Passos, and Wolfe. (Swauger)
- Eng 539 The Metaphysical Poets** 2 s.h.
The characteristic lyric poets of the seventeenth century from Donne to Cowley are studied in relation to changing social and political conditions. (Bright, Day)
- Eng 540 Twentieth Century American Drama** 3 s.h.
The contributions of the major dramatists of the twentieth century to the development of the American theater are considered. (Heimer)
- Eng 541 The Rise of American Regionalism** 3 s.h.
This course considers writers who drew their materials from the culture peculiar to a particular area. Such local colorists as Page, Harte, Harris, and Jewett are read. (Smith)
- Eng 543 The British Novel of the Eighteenth Century** 3 s.h.
Study of the British novel from Defoe through Jane Austen and the Gothic school, with some attention to narrative prose fiction before the eighteenth century. (Swigart)

Eng 544 The Psychology of Language 3 s.h.

This course is an introduction to psycholinguistics for the specialist in English. It deals with the fundamental ideas about language as a code, the acquisition of language, and the patterns of normal and aberrant human language behavior. (Green, Ianni)

Eng 545 The Age of Pope 3 s.h.

A close examination of the works of Alexander Pope and those of his contemporaries who most strongly influenced the rise of neo-classicism in England during the early 18th century. (McManmon)

Eng 546 The Age of Johnson 3 s.h.

A survey of the major literary tendencies between the death of Pope and the publication of *Lyrical Ballads*. A large portion of the course is devoted to Johnson as a literary figure in his own right.

Eng 547 Romantic Prose and Poetry 3 s.h.

This course concentrates on the revolt against the philosophic, social and aesthetic principles of the eighteenth century as it is revealed in the works of the major poets and essayists of the years 1798 to 1832. (Lucker, DeGeorge)

Eng 548 Victorian Prose and Poetry 3 s.h.

This course examines the major social, political, economic, and religious issues in the works of leading poets and prose writers to 1890. (Lucker, DeGeorge, Currey)

Eng 550 Workshop in Play Production 6 s.h.

The study of various styles of production and of the principles of directing in the preparation of plays for a high school audience. Included are analyses of the script, methods of casting and rehearsal, and the technical aspects of production. The summer theater is used as a laboratory for observation and participation. One day of lecture and library work, four days of laboratory. (Ensley)

Eng 551 Twentieth Century British Novel 3 s.h.

A study of the technique and history of the novel from 1900 to the present. Such figures as Conrad, Lawrence, Foster and Joyce will be read. (Heimer, Omrcanin)

Eng 552 Twentieth Century British Drama 3 s.h.

A reading of plays from the late 19th century to the present, including such older figures as Wilde, Shaw, and Synge, and such contemporary figures as Osborne and Pinter. (Heimer)

Eng 553 The American Renaissance 3 s.h.

The works of the major writers in mid-nineteenth century America. (Grayburn, Hull, Smith)

Eng 554 Contemporary American and British Poetry 3 s.h.

This course provides a close examination of American and British poetry since World War II and the chief influences on that poetry. Poets such as Lowell, Wilbur, Roethke, Larkin, and Hughes will receive particular attention, but much of the study will be directed toward particular "schools": the confessional poets, the "projectivists," the advocates of the "subjective image," the "beats," with the intention of understanding their purposes and their theories of form and idiom.

Eng 555 Realism in American Fiction 3 s.h.

This course examines the masterpieces of American realistic fiction from the late Romanticists through Mark Twain and to literary Naturalism. (Grayburn)

Eng 556 Modern British Poetry 2 s.h.

This course provides a close examination of major twentieth century British poets: Hardy, Hopkins, Yeats, Owen, Auden, Spender. (Betts, Heimer)

- Eng 557 Modern American Poetry** 2 s.h.
This course provides an intensive critical examination of the major twentieth century American poets from Eliot to the present. (Bright, Heimer, Betts)
- Eng 561 Tragic Themes of Classic Drama** 3 s.h.
A study of the structure and themes of the extant tragedies of Greece and Rome, together with the dramatic criticism of the two periods. (Hull)
- Eng 562 Epic and Lyric Poetry of the Classical Period** 3 s.h.
A study of the *Iliad*, the *Odyssey*, and the *Aeneid*, together with major writers of Greek and Roman lyric poetry. (Hull)
- Eng 565 The Faust Literature** 2 s.h.
The course provides a close study of the Faust tradition in literature and music, with major attention to Marlowe, Goethe, and Gounod. (Betts)
- Eng 567 Literary Britain** 3 or 6 s.h.
A three- or six-weeks tour of major sites important to English literature. The specific itinerary varies from year to year but always includes London, Stratford, and Cambridge.
- Eng 568 Teaching Composition in the Secondary School** 2 s.h.
The aim of the course is to help secondary school English teachers become better writers themselves and better critics of writing. The course will deal mainly with expository prose. Short essays will be written which the instructor will analyze and criticize for revision. Rhetorical analyses will be made of selections of prose by professional writers. (Staff)
- Eng 570 Major Writers: Hawthorne and Thoreau** 2 s.h.
Non-fictional prose of Thoreau compared with Hawthorne's short stories and major novels. (Hull)
- Eng 571 Major Writers: Faulkner and Hemingway** 2 s.h.
This course considers the novels and short stories of William Faulkner and Ernest Hemingway, with attention to each writer's influence on modern fiction. (Swauger)
- Eng 572 Major Writers: Thomas Hardy** 2 s.h.
Special studies are conducted in the poetry and fiction of a major writer of the late nineteenth century. (Betts)
- Eng 573 Major Writers: Whitman** 2 s.h.
Students study *Leaves of Grass* extensively to comprehend its unity of theme and structure, doing detailed analyses of major poems. Whitman's essays which best give insight into his poetical theory and social/political thought are also read. (Smith)
- Eng 574 Major Writers: Poe** 2 s.h.
A study of Poe's poetry, fiction, and literary criticism. (Hull)
- Eng 575 Major Writers: Henry James** 2 s.h.
This course provides for extensive and analytical reading of short stories, novels and criticism of Henry James with attention to his influence on modern fiction as craftsman and critic. (Omreanin)
- Eng 576 Major Writers: Joseph Conrad** 2 s.h.
Study is concentrated in the seven major novels and in a variety of the short stories of Conrad. (Betts, Heimer)
- Eng 577 Major Writers: Emerson** 2 s.h.
Emphasis is on the major prose and poetry of Ralph Waldo Emerson, with attention given to other writers of the Concord group. (Grayburn)
- Eng 578 Major Writers: Edmund Spenser** 2 s.h.
While this course focuses primarily on Spenser's major works—*The Shepheard's Calendar*, *The Amoretti*, *The Epithalamion* and *Prothalamion*,

The *Faerie Queen*, and The *Mutabilitie Cantos*—Spenser's unique position as the pre-eminent non-dramatic poet of the English Renaissance necessitates some study of both the Classical and Continental backgrounds of his work and his germinal importance to subsequent English poetry.

Eng 579 Major Writers: Alexander Pope 2 s.h.
Studies in the major work of Pope in such forms as the pastoral, the Horatian epistle, the verse essay, and the mock heroic. (McManmon)

Eng 580 Major Writers: Samuel Johnson 2 s.h.
Studies in Johnson as poet, essayist, novelist, dramatist, critic, biographer, lexicographer, and editor.

Eng 581 Major Writers: Jonathan Swift 2 s.h.
This course examines Swift as both Tory and satirist through a study of the major satires.

Eng 582 Major Writers: Wordsworth and Coleridge 2 s.h.
A close analysis of significant poems by the early Romantics and of critical commentary on their works. (Lucker, DeGeorge)

Eng 583 Major Writers: Byron, Keats, and Shelley 2 s.h.
The Romantic characteristics shared by these three poets, as well as the distinguishing characteristics of each writer, are examined by means of close analysis of significant poems. (Lucker, DeGeorge)

Eng 584 Major Writers: Tennyson and Browning 2 s.h.
Tennyson and Browning, as they offer a contrast in poetic styles, provide a study in both lyric and dramatic poetry and in the Romantic mode and the modern technique. (Betts)

Eng 585 Major Writers: Charles Dickens 2 s.h.
A study of the major novels by Dickens as they reflect the social problems of the age. (Curey)

Eng 586 Major Writers: D. H. Lawrence 2 s.h.
A study of the author as creator of fiction, poet and critic. (Heimer)

Eng 587 Major Writers: W. B. Yeats 2 s.h.
A study of the works, especially the poetry, of a leading Irish literary figure. (Betts, Heimer)

Eng 588 Major Writers: G. B. Shaw 2 s.h.
A study of the plays and other writings of a prominent and influential dramatist.

Eng 589 Major Writers: Herman Melville 2 s.h.
The many facets of Melville's prose, fiction and non-fiction, with major emphasis on *Moby Dick*. (Hull)

Eng 590 Major Writers: Mark Twain 2 s.h.
Students read representative books from the various categories of Twain's work: autobiography, travel, historical romances, social criticism, and light fiction. Detailed critical study is given the more significant novels. (Smith, Grayburn)

Eng 591 Major Writers: Frost and Robinson 2 s.h.
Studies in the lyric and narrative poetry of E. A. Robinson and Robert Frost. (Betts)

Eng 592 Major Writers: T. S. Eliot 2 s.h.
Studies in the work of T. S. Eliot: the plays, the poetry, the criticism, the nature and extent of his influence. (Betts)

Eng 593 Major Writers: Fitzgerald and Lewis 2 s.h.
Study of both primary and secondary sources that reveal these two writers as shaped by and shaping the American 1920's. Emphasis will be

placed on the writing they did during this period, although their other work will be considered as well. (Cook)

Eng 600 Seminar in British Literature to 1500 3 s.h.

For advanced graduate students who need either extensive or intensive study in an area not treated by an existing course in the Anglo-Saxon or Middle English period. Subject areas covered by this seminar will be announced in advance each time the course is offered. Prerequisite: At least one graduate course in Old or Middle English. (Como)

**Eng 610 Seminar in British Literature—
Renaissance (1500-1660)** 3 s.h.

For advanced graduate students who wish to make an intensive or extensive investigation of an area of the English Renaissance that is not currently treated in course work. The subject for each seminar will be announced in advance of registration. Prerequisite: At least one graduate course in the English Renaissance. (Day, Rider)

Eng 620 Seminar in Shakespeare 3 s.h.

Students are urged to pursue special problems of particular interest in Shakespeare studies. (Prior study in the field is a valuable prerequisite for the course.) Students prepare papers which they read and defend before their colleagues. The emphasis is on individual study and research in primary and secondary sources.

**Eng 630 Seminar in British Literature—Restoration and
Eighteenth Century (1660 to 1800)** 3 s.h.

This course offers students the chance to pursue special areas of interest within the rich and varied literature of the period. The course, as it is given in different semesters with different teachers, will have changing content and emphases.

**Eng 640 Seminar in British Literature—
Nineteenth Century (to 1870)** 3 s.h.

This course, for advanced graduate students, provides for independent study in depth of some of the major Romantic and Victorian literary figures. Prerequisite: Either a graduate or an undergraduate course in the period.

Eng 660 Seminar in Modern British Literature (from 1870) 3 s.h.

Seminars in Modern British Literature study in detail figures, movements, or genres within the span of 1870 to the present. After an introductory lecture, class sessions are devoted to the reading and critical discussion of seminar members' papers.

Eng 670 Seminar in American Literature to 1870 3 s.h.

A seminar for advanced students in American literature, covering works of major writers in such areas as the Puritan period, the early republic, the Romantics, and other phases of American literature up to and including the Civil War. Prerequisites: Either course work in American literature to 1870 on the master's level, or an undergraduate course in American literature, plus sufficient individual reading on the part of the student to compensate for inadequate formal course work.

Eng 680 Seminar in Modern American Literature (from 1870) 3 s.h.

A seminar for advanced students, to provide for research and study in depth of selected writers and movements of this period. Research will center upon such subjects as the following: a particular author or group of authors; a literary genre, a literary movement; a restricted period of time, etc.

Eng 690 Seminar in Literary Criticism 3 s.h.

The purpose of this course is to produce through independent study a paper on the aesthetics of literary expression. The student investigates theories of literature as expressed by the great critics from Aristotle to the

present. In the paper he can either formulate and attempt to validate some original hypothesis of his own about the nature of literature or explore the labors of some critic or critics in applying their principles to the judgment of literature. The course provides a framework for the specialist in literature to do historical and theoretical research in literature as art. (Ianni)

Eng 695 Seminar in Linguistics **3 s.h.**

The course includes topics on the phonology, grammar, and semantics of English past and present, to provide the stimulus for independent study in depth on some specific topic regarding the nature of the English language. Prerequisites: Eng 544, The Psychology of Language and Eng 512, American English Grammar. (Green, Ianni)

Eng 696 Seminar in the Teaching of College English **3 s.h.**

This course examines the various professional and pedagogical aspects of teaching college English as revealed by current practices and the changes suggested by research. Study is made of materials and techniques of teaching freshman composition, advanced composition, and introductory literature, as well as upper level courses. Topics for discussion include participation in professional societies and the administration of college English departments. Required of doctoral candidates. (Staff)

ROMANCE AND CLASSICAL LANGUAGES

Charles W. Faust, Chairman

Herbert E. Isar, Director of Graduate Studies

Isolde A. Henniger

Cruz Mendizabal

Arthur A. Leone

David L. Shields

CURRICULUM FOR MASTER OF EDUCATION DEGREE (SPANISH)

Students working for this degree will complete thirty (30) semester hours and a research project. A minimum of eighteen (18) semester hours in subject matter content (i.e., Spanish) must be included, unless the candidate elects FL 525. In that case, a minimum of twelve (12) semester hours in Spanish will be required. A reading knowledge of French or of a second foreign language acceptable to the Department must be demonstrated before the student is admitted to candidacy for the degree with a major in Spanish.

I. Subject Matter Concentration Area—FL 525 and twelve (12) semester hours or eighteen (18) s.h., minimum, but *vide infra*.^o

Span	510	History of the Spanish Language	2 s.h.
Span	511	Stylistic Studies	2 s.h.
Span	512	Advanced Composition and Conversation	2 s.h.
Span	520	Medieval Spanish Literature	2 s.h.
Span	521	Seminar on Cervantes	2 s.h.
Span	522	Seminar on Perez Galdos	2 s.h.
Span	523	Seminar in the Generation of 1898	2 s.h.
Span	524	Hispanic Poetry since 1888	2 s.h.
Span	525	The Spanish Novel after the Civil War	2 s.h.
Span	530	Hispano-American Authors (Social Themes)	2 s.h.

II. Related Studies

Eng	521	Modern European Fiction	2 s.h.
Eng	544	Seminar in the Psychology of Language	2 s.h.
FL	521	Language and Society ^o	2 s.h.
FL	525	Foreign Study (Valladolid) (optional)	6 s.h.
Geog	527	Mexico, Middle America and West Indian Islands	2 s.h.
Geog	528	South America	2 s.h.
Hist	542	Contemporary Latin American Problems	2 s.h.
Anth	592	Comparative Cultures ^o	2 s.h.
Anth	593	The Science of Culture	2 s.h.

III. Foundations of Education—two (2) semester hours of work selected from:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Research Techniques—the following course is required. It should be scheduled early in the student's program but not as the first (graduate) course.

Grad	515	Elements of Research	2 s.h.
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^oIf undergraduate credits were obtained for study at the University of Valladolid, FL 525 cannot be taken, and the candidate will satisfy requirements by taking thirty credits (eighteen in Spanish) at the Indiana University of Pennsylvania.

^ooCannot be taken if candidate received undergraduate credit for Ling 421.

^ooPrerequisite: Introductory Anthropology on the undergraduate level.

**COURSE DESCRIPTIONS IN THE MASTER'S DEGREE
CURRICULUM WITH CONCENTRATION IN SPANISH**

FL 521 Language and Society 2 s.h.

The work of this course is designed to acquaint the student with the salient facts of language and its fundamental role in the development and continuity of society and culture. Some points considered are: language families and their characteristics, factors of linguistic change and development, reciprocal influences of culture and language, linguistic borrowing, psycholinguistics, and systems of writing. (Open to non-majors and majors)

FL 525 Foreign Study (optional) 6 s.h.

Intensive study of the Spanish language and culture at the University of Valladolid, Spain, from approximately February 1 to July 1. For a detailed description vide the annual Indiana University publication, **THE PENNSYLVANIA-VALLADOLID STUDY IN SPAIN PROGRAM**.

NOTE: In the case of candidates for an advanced degree in a field other than Spanish, the 6 credits earned in FL 525 can be applied toward the Master's Degree at Indiana University, representing elective credits.

FL 525 is of exceptional interest and value to persons who have begun the teaching of Spanish in recent years.

In addition to the annual Indiana University of Pennsylvania publication, **The Pennsylvania-Valladolid Study in Spain Program**, vide the annual pamphlet, **Curso de estudiantes norteamericanos de la "Indiana University of Pennsylvania"**, printed by the Facultad de Filosofia y Letras (School of Arts and Sciences), University of Valladolid, Spain. (The latter publication is available at the office of the Program Director, Dept. of Romance and Classical Languages, Indiana University of Pennsylvania.)

Span 510 History of the Spanish Language 2 s.h.

The development of Castilian (phonological, morphological, semantic and syntactic) from the earliest written records to the present time; dialects and dialect geography, particularly in Spanish America; vocabulary borrowing as indicative of cultural imports.

Span 511 Stylistic Studies 2 s.h.

Intensive and detailed analysis of selected modern prose works, preferably the novel and essay, with emphasis upon the study of syntax, idiomatic elements, and colloquialisms. Written and oral reports in Spanish.

Span 512 Advanced Composition and Conversation 2 s.h.

This course stresses the acquisition of fluency in speech and accuracy in written work in Spanish. Supervised teaching on the part of the graduate student in the course will develop poise while intensifying the ability to speak with ease and to correct mistakes in writing.

Span 520 Medieval Spanish Literature 2 s.h.

Study of representative texts from the origins through the fifteenth century, the epic, the chronicle, the theater, the ballad. The **Cantar de Mio Cid**, **Auto de los Reyes Magos**, and the **Roncesvalles** fragment will be dealt with in depth; significant portions of other items will be read.

Span 521 Seminar on Cervantes 2 s.h.

Analysis of the thought and style of Cervantes, with special emphasis on the **Quixote**.

Span 522 Seminar on Perez Galdos 2 s.h.

Analysis of the spiritual orientation (e.g., Christian existentialism), thought, and style of the author, notably in his **Novelas Contemporaneas**. Oral and written reports in Spanish.

Span 523 Seminar in the Generation of 1898 2 s.h.

Intensive study of the historical and ideological significance and literary contribution of the galaxy of writers known as the Generation of '98, notably Unamuno, "Azorin", Benavente, Baroja, Ortega, and Blasco Ibanez.

Span 524 Hispanic Poetry since 1888 2 s.h.

Rubén Darío and the rise of *modernismo* in Spain and Spanish America; poetry and the Generation of '98; reactions against *modernismo*.

Span 525 The Spanish Novel after the Civil War 2 s.h.

Detailed analysis of the impact of the Spanish Civil War in its triple consideration as an ideological, political, and social conflict, on the novel and the subsequent evolution of Spanish narrative. Significant works by Cela, Gironella, Laforet, Delibes, Quiroga, Matute, and Goytisolo will be read. Oral and written reports in Spanish.

Span 530 Hispano-American Authors (Social Themes) 2 s.h.

Study of the most significant texts from colonial times to the present, the chronicle, poetry, essay, and especially the modern novel as the main exponent of the problems confronting Spanish-American society.

Note that all courses, except FL 521, are conducted in Spanish.

GENERAL SERVICES COURSES

A. Courses offered by the School of Education

George A. W. Stouffer, Jr., Dean

Ed 522 Principles and Practices in Speech Improvement 2 s.h.

This course will provide for a study of the normal development of speech, classroom methods in speech improvement, and special consideration for children handicapped in speech or hearing. Library research, project work, demonstrations and experimentation will be heavily stressed.

Ed 540 Supervision and Student Teaching 2 s.h.

Designed for supervising teachers and others working with student teachers, this course provides opportunity for the development of pertinent materials and for continuous evaluation of various aspects of the student teaching program. Stress is also given to evaluate procedures used in working with prospective teachers. Basic principles underlying an effective student teaching program are examined from a theoretical and applied viewpoint. Prerequisite: Teaching certificate and teaching experience.

B. Courses offered by Foundations of Education

Don-Chean Chu, Chairman

FdEd 511 Historical Foundations of Education 2 s.h.

A study of the historical development of American education. European influences of the philosophies and practices of American schools will serve as a background for the course. Emphasis will be placed on the development of education in America as influenced by various individuals and schools of thought. Historical trends will be related to current problems and practices in education.

FdEd 512 Philosophical Foundations of Education 2 s.h.

The development of principles upon which to base instruction, recent developments in scientific methodology, and theories of curriculum and school organization will be considered in this course. Stress will be placed upon the essential phases involved in building an individual working philosophy of education.

FdEd 513 Social Foundations of Education 2 s.h.

This course will deal with those social and cultural forces which influence education and the ways in which education has been affected by them. Particular stress will be placed upon current problems as they relate to the entire educational system and to curricular problems and practices in today's schools.

FdEd 514 Comparative Foundations of Education 2 s.h.

The educational theories and practices in different nations will be studied. The educational purposes, curriculum, methods, administration, school system, teacher education and other educational features in America and those in other nations, will be analyzed, evaluated, and compared.

FdEd 599 International Education Studies Program 3 s.h.

A travel-seminar conducted in a foreign country and designed to afford educators and students of education the opportunity to investigate the teaching-learning process in cultural settings other than their own. Particular attention will be paid to such current educational issues as theories of curriculum development, methodology, teacher education, and changing value systems.

C. Research

George W. Wiley, Associate Dean of the Graduate School for Research

Grad 515 Elements of Research

2 s.h.

Selection of a research problem, collection of data, types of research, the research report, and the use of the library in connection with the research problems will be studied. Elements of statistics are introduced. This course provides background for the preparation of the thesis or research project, and enables the student to become an intelligent consumer of the products of educational research. As part of the requirements for this course the student will prepare a written plan for a research project or thesis.

NOTE: Some sections of Grad 515 are taught by departments exclusively for their majors. Students should check with their department chairmen before scheduling Grad 515.

Grad 550 Thesis or Recital 2-4 s.h.

Students writing a thesis for credit will register for this course. Grad 550 should be scheduled for the semester that the student plans to have his final thesis meeting (See step 18, p.).

Recital: Graduate students in music education may prepare and perform a formal recital under the guidance of their private teacher in their major performing area. Approval for the presentation of a recital in lieu of the thesis must be secured from the graduate committee of the Music Education Department. A student should secure approval for this event early in his graduate program, but the actual performance of the recital should occur close to the end of his graduate program.

Grad 650 Dissertation to be arranged

Students preparing a doctoral dissertation for credit must register for this course. The number of credits assigned and the extent of time for which the research activity is scheduled depend upon the nature and scope of the individual student's research problem as well as his total doctoral program.

D. Statistics

Melvin Woodard, Chairman of Department of Mathematics

Grad 516 Statistical Methods I 2 s.h.

Consists of measurement and statistical techniques as used in teaching, school administration, and common educational research. The basic descriptive statistics, including measures of central tendency, variability and correlation will be developed. The reliability and validity of test scores will also be discussed. Emphasis will be placed upon the use of the statistical techniques studied and their interpretation.

Grad 517 Statistical Methods II 2 s.h.

Advanced statistical devices for educational research workers. The basic concepts of statistical inference and prediction will be developed, including regression and prediction, hypothesis testing, analysis of variance, and partial and multiple correlation. Emphasis will be placed upon the use of interpretation of the techniques studied. Prerequisite: Grad 516 or equivalent.

E. Computer Science

Jack Thompson, Acting Director

CSci 501 Computer Programming for Research 2 credits

An introduction to digital computer programming. Emphasis will be placed on the development of sufficient skill in an algorithmic programming language to allow students to formulate and solve the type of computer problems encountered in most graduate research projects. Credits earned in this course may not be applied toward a graduate degree in Computer Science. Prerequisite: None.

CSci 502 Computers in Education 3 credits

A survey of digital computers with an emphasis on computer usage in education. History of computation. Fundamentals of computer design and

computer programming. Discussion of computer applications in educational administration, pupil personnel services, educational research and the instructional process. Credits earned in this course may not be applied toward a graduate degree in Computer Science. Prerequisite: None.

CSci 510 Numerical Analysis I

3 credits

An analysis of algorithmic methods for solving linear and non-linear equations. Iterative techniques, finding roots for polynomials, and interpolation using difference formulas. Programming of several of the methods in an algorithmic language will be encouraged. Prerequisite: Math through calculus and working knowledge of a programming language.

CSci 511 Numerical Analysis II

3 credits

An analysis of algorithmic methods for numerical integration and differentiation, curve fitting, solutions of systems of equations by direct and iterative methods, matrix inversion, and evaluation of determinants. Solution of boundary value problems in ordinary differential equations and an introduction to solutions of partial differential equations. Selected algorithms should be programmed in an algorithmic language. Prerequisite: Math through calculus and working knowledge of a programming language.

GEOGRAPHY

Thomas G. Gault, Chairman

Maurice M. Zacur, Director of Graduate Studies

Mamie L. Anderzhon

Ruth I. Shirey

Donald J. Ballas

Leonard P. Tepper

Gopal S. Kulkarni

William D. Warren

Isadore R. Lenglet

Charles E. Weber

Vincent P. Miller, Jr.

David C. Winslow

James E. Payne

The pursuit of a Master's Degree with a major in Geography presupposes that certain courses have been completed in the undergraduate geography major. The department will accept applicants with limited background in Geography provided deficiencies be remedied through extra course work or a personal reading program.

The Department invites students with a limited geography background to extend their general education through enrollment in geography courses. Students in Elementary, Social Science, Science, or Business may find Geography courses closely related to their fields. The minimum prerequisite for entering all graduate geography courses is three credits of undergraduate geography.

Courses numbered above 540 (except 589 and 590) have a prerequisite of six credits of geography and are not recommended for other than geography, social science, or science majors, but may be taken with permission of the department chairman. Courses numbered above 590 have a prerequisite of 18 hours of geography.

The degree which a student should pursue will depend upon the personal objectives of the individual. The Master of Education (M.Ed.) degree is professionally oriented toward teaching as a career.

The Master of Arts and Master of Science degrees are designed with knowledge of subject matter as the objective rather than application to professional use. Although these degrees are complete programs they also are designed as preparation for further study toward the doctorate. The Master of Arts and Master of Science degree differ both in their programs and in the background required.

The Master of Arts degree is structured for the student who is interested in the human, economic, and urban development of earth space.

The Master of Science degree is planned for the student with a mathematics and science background who is interested in the study of the physical factors in environment.

A student working for the Master's Degree in Geography shall demonstrate competence in a core program of 10 credits. The competence shall involve a knowledge of content as well as mature judgment and interpretation.

In addition to a core program, students select a concentration of 10 credits in geography. Courses related to the concentration, approved by the advisor, may be taken outside the department.

Further, each degree candidate must complete the research requirement as established by the Graduate Council. The candidate may meet this requirement by a thesis or written project.

The student completes thirty (30) credits in accordance with the following divisions:

I. Subject Matter Concentration	20-24 s.h.
A. Core (required)	10 s.h.
Geog 594 Field Techniques	2 s.h.
Geog 589 Cartography*	2-3 s.h.

- Geog 591 Geographic Thought*2-3 s.h.
 Geog 592-593 Geographic Research3 s.h.
- M.Ed. candidates may take Grad 515, Elements of Research, in lieu of Geog 592, with special permission.
 *If these have been taken at undergraduate level, additional courses will be elected with departmental consent.
- B. Student Interest (as approved by advisor)10-14 s.h.
1. M.Ed. 10-14 s.h. of geography.
 2. M.A. 10-14 s.h. of geography: Human, Economic, Urban/Regional Planning.
 3. M.S. 10-14 s.h. of physical geography or Geo-Science.
- II. Related Studies6-10 s.h.
 Courses within and outside the department taken to strengthen the concentration as approved by advisor.
1. M.Ed. take 2 s.h. from each of three categories below:
 - a. Grad 516 or 517 Statistical Methods *or* graduate course in Learning Resources2 s.h.
 - b. Ed. 511, 512, 513 Historical, Philosophical *or* Social Foundations of Education2 s.h.
 - c. Geog 511 Professional Problems in Geography Ed. *or* an approved Psychology course2 s.h.
 2. M.A. take 6-10 s.h. of related Social Science or Geography
 3. M.S. take 6-10 s.h. of related Geo-Science or Geography
- III. Research (in addition to core program)0-4 s.h.
 Grad 550 Thesis2-4 s.h.
 or Project0 s.h.

Course Descriptions

- Geog 510 Internship: Community College Teaching** 2 s.h.
 Students consider the goals and objectives of general education and the discipline. Various course organizations as well as materials, methods and teaching techniques will be examined. Opportunity to participate in classroom planning, teaching, and evaluation will be available.
- Geog 511 Contemporary Geography Issues** 2-3 s.h.
 Geographic analysis of contemporary issues. Topics will vary with interest and needs of students and staff available. Topics may be such as: Geography of Disease, Urban Environment, Geography of Egyptian-Israeli Conflict. Student is limited to 6 s.h. for this course.
- Geog 512 Settlement Geography** 2-3 s.h.
 Study of settlement patterns and processes: Origins, diffusion, classification, pioneer settlement, settlement planning, and agricultural colonization. Includes urban settlement but will stress smaller settlements.
- Geog 513 Population Geography** 2-3 s.h.
 Variations in numbers, characteristics and dynamics of human population, models and theoretical constructs relevant to demographic structures and processes in a spatial context; and major problems related to urbanization are discussed and evaluated.
- Geog 514 Quantitative Techniques in Geography** 2 s.h.
 Descriptive and inferential statistical techniques applied to spatial distribution and spatial association of physical and cultural phenomena and testing of spatial theoretical constructs.
- Geog 516 Historical Geography of Cities and City Planning** 2-3 s.h.
 Prerequisite: 12 s.h. of Geog or Soc Sci. Examines the process of city planning during the ancient, medieval, renaissance periods, and a review

of early planning in America, as well as present city planning. (Lenglet, Warren)

Geog 517 General City and Regional Planning 2-3 s.h.

Prerequisite: Geog 516 or equivalent. Examines four phases involved in preparation of a community plan. Items such as land use, natural resources, topography, soils, geology, climate, and drainage are utilized in a general comprehensive plan. (Lenglet, Warren)

Geog 518 Urban Design 2-3 s.h.

Prerequisite: Geog 517 or equivalent. Offers students opportunity to work with various concepts of city and subdivision design utilizing the effects of topography, natural resources, and other physical elements upon urban design. (Lenglet, Warren)

Geog 519 Urban Planning Basic Studies and Analysis 2-3 s.h.

Prerequisite: Geog 517 or equivalent. Research, analytical design and plan-making techniques in urban and regional planning. Examines basic items necessary to prepare urban and regional comprehensive plans. (Lenglet, Warren)

Geog 520 Physical Geography 2 s.h.

Study of development, classification, distribution and interpretation of: landforms, climates, soils, natural vegetation, underground resources, and water resources. Interrelationships in the physical environment are studied to understand the earth as home of man. (Payne)

Geog 521 Advanced Human Geography (non-majors) 2 s.h.

The course is designed as a refresher course in geography for the non-geography major. Both systematic and regional studies will be made to acquaint the student with modern geography methods and techniques. (Gault, Ballas)

Geog 522 Aerospace Science (non-majors) 2-3 s.h.

Workshop conducted with visiting aerospace authorities on: space environment; history of flight; flight problems; satellites; space probes; space exploration; etc. A bibliography for elementary and secondary levels is provided. (Winslow)

Geog 523 Urban Geography 2-3 s.h.

An analysis is made of city types, patterns and functions as influenced by geographic conditions and other factors. City planning techniques and field study are utilized. (Winslow, Kulkarni)

Geog 524 Cultural Geography 2 s.h.

A study of the literature and methods of cultural geography. Topics to be studied include population, settlements, human ecology, culture areas, and related features. Individual study, analysis and reports will be stressed in addition to lecture. (Ballas)

Geog 525-540 Geography Regional Seminar ea. 2-3 s.h.

Each region is examined in detail for soil, topography, climate, vegetation, population, and the interrelationships evolved. Stress is placed on individual study and class discussion rather than lectures. Only two are allowed toward M.A. degree.

Geog 525 Africa, South of Sahara (Ballas)

Geog 526 India, Pakistan, and Indo-Chinese Peninsula (Weber, Kulkarni)

Geog 527 Mexico, Middle American and West Indian Islands (Winslow, Shirey)

Geog 528 South America (Winslow, Shirey)

Geog 530 U.S.S.R. (Zacur)

- Geog 531 Northwestern Europe** (Miller)
- Geog 534 China, Korea, and Japan** (Weber)
- Geog 535 Australia and Pacific Islands** (Anderzhon)
- Geog 540 Geography of Pennsylvania** (Zacur)
- Geog 541 Agricultural Geography** 2-3 s.h.
World Agriculture patterns are the core of this course. Specific problems will be studied in view of both the countries involved and world environment. Stress will be placed upon individual study and research as well as classroom lecture. (Gault)
- Geog 542 Industrial Geography** 2-3 s.h.
Resources useful in the manufacturing process will be studied both as to their location and their place in the international exchange patterns of the world. Individual problems will be the core of the course placing great emphasis on research and reading. (Winslow)
- Geog 550A, B, C Geographic Readings in Geography** 2-6 s.h.
Geographic readings may be taken either as individual study or in group study. Readings may be either to gain breadth of geographic knowledge or depth in a particular segment of geography. (Staff)
- Geog 551 Professional Problems in Geographic Education** 2-3 s.h.
Classroom problems and discussion centered about "New Viewpoints in Geography" constitute the core of this course: Individual reports, group discussion and research will constitute the principal methods of presentation. (Anderzhon)
- Geog 552 Seminar in World Resources** 2-3 s.h.
Exploitation and utilization of World Resources, i.e.: agriculture, mineral, forest, fish, etc. Problems of energy utilization, food distribution, population growth, regional planning, factory location, conservation measures are treated. (Weber)
- Geog 553 Political Geography** 2-3 s.h.
Geographic factors and conditions are analyzed as they relate to the character and function of states. Political institutions are evaluated in light of geographic conditions. Emphasis is given to the great world powers and geopolitical thought. (Miller)
- Geog 560 Urban Planning Seminar** 2-3 s.h.
Prerequisite: Geog 517 or equivalent. Deals primarily with various plans and planning proposals necessary to prepare an urban or regional plan. This will include Future Land Use Plan, Community Facilities and Public Utility Plans, and Traffic and Circulation. (Lenglet, Warren)
- Geog 561 Urban Plan Implementation** 2-3 s.h.
Prerequisite: Geog 517 or equivalent. Considers zoning, improvement programs, housing codes, building codes, methodology and application of administrative procedures, Federal and Local Urban Renewal Programs, site selection, program administration.
- Geog 573 Climatology** 2-3 s.h.
Dynamic and physical aspects of climatology. Topics covered: heat and water budget; principles of climatic classification; Koppen, Thornthwaite; paleoclimates; regional climates of the continents; microclimates; statistical and mathematical models.
- Geog 588 Physiography (United States)** 2-3 s.h.
Presents a detailed study of the origin, classification, and structure of mountains, plains, coast lines, rivers, lakes, and subsequent modification by glaciers, stream erosion, wind abrasion, tides and ocean waves. (Payne)

- Geog 589 Cartography** 2-3 s.h.
Develops ability to map and diagram place location, areal distribution, and statistical data in thesis or professional papers. Special maps, charts, and diagrams will be considered as required by individual student. (Payne)
- Geog 590 Maps and Photographic Interpretation** 2-3 s.h.
Designed to develop skill in extracting information and to synthesize data from maps and aerial photographs into geographic relationships related to geology, economy, land use, transportation, or strategic use. (Payne)
- Geog 591 Geographic Thought and Philosophy** 2-3 s.h.
Seminar in the history of the discipline, great ideas of geography, leading professionals, and unresolved issues. (Staff)
- Geog 592 Geographic Research** 3 s.h.
The elements and techniques of scientific research, as applied to geography problems, are studied. A proposal thesis topic is developed.
- Geog 594 Field Techniques in Geography** 2-3 s.h.
Field Techniques are discussed and evaluated. Field tools and techniques are used in the study of a specific area. Emphasis is upon skill and interpretation of aerial patterns of geographic phenomena. (Staff)
- Geog 595 Regional Field Studies** 2-3 s.h.
Field observation and analysis of geographical relationships which exist between various physical and cultural phenomena. The student must secure department permission prior to field work.
- Geog 599 Supervised Internship Teaching Experience** 0-2 s.h.
Supervised teaching experience at the graduate level with stress on new materials and innovative teaching techniques. Open only to students who have completed eight credits of graduate work. Note: credit cannot be used toward Master's degree. (Staff)

GEOSCIENCE

Robert L. Woodard, Acting Chairman

Walter H. Granata, Jr.

Paul A. Prince

Frank W. Hall, II

Connie J. Sutton

Frederick R. Park

The geoscience department embraces several areas of study related to the earth, its structure, and its environment; specifically astronomy, geology, meteorology, and oceanography. The department participates in the Consortium of Marine Science operated jointly with nine other Pennsylvania Institutions at Lewes, Delaware. Graduate courses offered by the Consortium have the same acceptance as those taken on campus. Courses taken under descriptions in the Indiana University of Pennsylvania catalogue, with tuition paid to Indiana, are treated as in-resident courses but those taken under other descriptions are subject to the same limitations of all transferred credits.

Master's level degree programs are being prepared for review. While these unique programs are being developed the department will continue to grant a Master of Education in Science degree as a program for earth and space science teachers. Each candidate's courses and research will be selected in accord with his professional objectives and may include courses from this or other departmental offerings as they apply to his situation.

While it is known to be desirable to advance in this field as an extension of one's undergraduate work, it is recognized that the present teaching situation in the Commonwealth is such that many students will be entering the field without such training. Candidates will therefore be considered who have a minimum of one year of study in each biology, chemistry, and physics. The programs for these people will then call for most of one's work in the geosciences.

SCIENCE

Curriculum for Master of Education Degree

Students working for this degree with a major in Science will complete the thirty (30) semester hours of work in accordance with the following divisions:

- I. Subject Matter Concentration Area—fourteen to twenty-two (14-22) semester hours of work in subject matter content is to be selected from the various courses in the areas of Biology, Chemistry, Geoscience, and Physics at the discretion of the candidate's adviser.

Courses from the Geoscience Department which may be elected to fulfill this requirement are:

Astro	534	The Solar System	2 s.h.
Astro	536	The Sidereal Universe	2 s.h.
Astro	540	Operation of the Planetarium	2 s.h.
Geol	503	Earth Processes	3 s.h.
Geol	504	Earth History	3 s.h.
Geol	505	Earth Materials	2 s.h.
Geol	506	Earth Deformation	2 s.h.
Geol	507	Life of the Geologic Past	2 s.h.
Geol	508	Glacial Geology	2 s.h.
Geol	514	Crystallography	2 s.h.
Geol	515	Mineralogy	2 s.h.
Geol	516	Petrology	2 s.h.
Geol	535	Geomorphology	2 s.h.
Geol	570	Invertebrate Paleontology	2 s.h.
Geos	570	Oceanography I	2 s.h.
Geos	571	Oceanography II	2 s.h.

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|------|-----|--|----------|
| Geos | 572 | Meteorology | 2 s.h. |
| Geos | 581 | Problems in Geoscience | 1-2 s.h. |
| Geos | 591 | Field and Laboratory Investigation in Geoscience | 1-4 s.h. |
- II. Professional Studies—four to ten (4-10) semester hours of work, including Research Paper or the Thesis, to be selected from the following:
- | | | | |
|------|-----|-------------------------------------|----------|
| Grad | 516 | Statistical Methods I | 2 s.h. |
| Grad | 550 | Thesis | 2-4 s.h. |
| LRes | 500 | Seminar in Learning Resources | 2 s.h. |
| Psy | 531 | Psychology of the Exceptional Child | 2 s.h. |
| Psy | 532 | Studies in Pupil Adjustment | 2 s.h. |
- III. Foundations of Education—two (2) semester hours of work to be selected from the following courses:
- | | | | |
|----|-----|--|--------|
| Ed | 511 | Historical Foundations of Education | 2 s.h. |
| Ed | 512 | Philosophical Foundations of Education | 2 s.h. |
| Ed | 513 | Social Foundations of Education | 2 s.h. |
- IV. Research Techniques—the following course is required. It should be scheduled early in the student's program:
- | | | | |
|------|-----|----------------------|--------|
| Grad | 515 | Elements of Research | 2 s.h. |
|------|-----|----------------------|--------|

In certain courses in the science department, additional laboratory time may be required beyond the regularly scheduled periods. Students who select a four-credit sequence are required to complete the sequence.

Course Descriptions

Astro 534 The Solar System 2 s.h.

This course is planned as a study of the characteristics and behavior of the planets and their satellites, asteroids, meteors, comets, and other phenomena of the solar system. One of the major topics will be to investigate and criticize several of the theories of its origin. It will require some treatment of celestial mechanics but will not require a background of calculus.

Astro 536 The Sidereal Universe 2 s.h.

A study of the characteristics and classification of the stars, their assemblage in groups and galaxies and their evolution. Techniques of gathering data are examined to gain an understanding of the role of the telescope, spectroscope and photometer in astronomical research. Laboratory exercises and night observations are a part of the course. Credit will be given only to those for whom the course represents an area of study for which credit has not previously been recorded.

Astro 540 Operation of the Planetarium 1 or 2 s.h.

A course designed to give directed study in the use and operation of the Spitz planetarium. The student will learn to: (1) select and present topics of astronomy for various educational levels through the medium of the planetarium, (2) make planetary setting adjustments of the instruments, (3) perform minor maintenance of the instrument, and (4) coordinate all aspects of program and instrument capability in the presentation of classroom instruction and public planetarium shows. Either an instructional program or a show for a public group will demonstrate accomplishment of the above objectives.

Prerequisites: Minimum of one previous year of study in astronomy including both the Solar Family and Sidereal Universe or ability to demonstrate a comparable proficiency by examination.

Geol 503 Earth Processes 3 s.h.

A study of the processes operating on the crust of the earth in the present and in the geologic past. Emphasis will be upon formation, alteration, transportation, and distortion of the materials making up the known portion of the earth.

Geol 504 Earth History 3 s.h.

Earth History is designed to present to the student an understanding both of the underlying principles used in deciphering earth history as well as the geologic development of North America through geologic time.

Geol 505 Earth Materials 2 s.h.

A study of the concentration of elements which make up the earth, the formation of stable compounds called minerals from the available elements and the aggregation of minerals to form rocks.

Geol 506 Earth Deformation 2 s.h.

Study of the deformation structures of the earth's crust and the principles and processes involved in their genesis.

Geol 507 Life of the Geologic Past 2 s.h.

This course is designed to acquaint students with the basic morphologic features of both invertebrate and vertebrate fossils and an understanding of their relative abundance and importance in the geologic past.

Geol 508 Glacial Geology 2 s.h.

A study of the phenomenon of glaciation, including the study of glacial movement, glacial deposits, and an investigation of possible causes of glaciation. A working acquaintance with glacial land forms is provided by means of field trips to the glaciated region of N. W. Pennsylvania.

Geol 514 Crystallography 2 s.h.

This course is designed for the geologist, chemist, and physicist. Minerals are studied utilizing common field and X-ray notation. External and internal morphology is examined. Stereographic projection techniques are applied. Prerequisites: Fundamentals of Mathematics, plus Mineralogy or Physical Chemistry, or permission of instructor.

Geol 515 Mineralogy 2 s.h.

This course is a workshop in the study of and identification of minerals, the theory of mineral formation and structure, and mineral relationships. Simple chemical and physical techniques will be used for mineral identification. Prerequisite: Physical Geology or General Chemistry.

Geol 516 Petrology 2 s.h.

This course is a study of rock phyla and their chemical and spatial relationships in the earth. Special attention is given to the genesis, mineral composition, and classification of the rock types. The ecology of igneous, sedimentary, and metamorphic rocks is studied in detail. Prerequisite: Mineralogy.

Geol 535 Geomorphology 2 s.h.

A study of landforms and the processes and principles that govern both their origin and their subsequent development. Prerequisite: Structural Geology.

Geol 570 Invertebrate Paleontology 2 s.h.

A morphological study of the major invertebrate life forms of the geologic past and their distribution in space and time. Prerequisite: Historical Geology or Zoology.

Geos 570-571 Oceanography I and II 2-4 s.h.

An introduction to the physical, chemical, biological and geological nature of the ocean. Physical properties, distribution of variables, mass and energy budgets. Water masses and their circulation. T-S diagrams. Dynamical aspects of waves, tides, and currents. Common instruments in use. Elementary discussion of primary production, basic chemical reactions, and the primary geological features of the sea floor. Oceanography I is a prerequisite to Oceanography II. Both courses require a five day field trip to the Pennsylvania Consortium of Marine Science field station at Lewes, Delaware. Lectures, readings, term paper, laboratory and field trip. Permission of instructor required for course registration.

Geos 572 Meteorology

2-3 s.h.

Basic and advanced considerations of the physical processes of the atmosphere. Basic parameters. Common instruments in use. Composition and structure of the atmosphere. Heat budget. Radiation laws, stability characteristics, isentropic analysis, cloud and rain physics. Circulation patterns, storm structures and atmospheric electricity. Lectures, readings, term paper, laboratory. Permission of instructor required for course registration.

Geos 581 Problems in Geoscience

1-2 s.h.

A course designed to provide the student with an opportunity to study an area of astronomy, geology, meteorology, or oceanography not available in regular course offerings. The topic of study will be selected in consultation with one's major adviser to enhance the student's avowed program.

Geos 591 Field & Laboratory Investigations in Geoscience

1-4 s.h.

A course listing to provide the opportunity for doing laboratory or field research in an assigned area of astronomy, geology, meteorology or oceanography. The problem will be defined and evaluated in consultation with the student's major adviser and the professor guiding the particular study. A maximum of four credits may be earned in the master's program and might be taken in segments or as one larger study. A written report summarizing the background information, research activity, and results will terminate each course requirement.

HEALTH-PHYSICAL EDUCATION

John Miller, Chairman

John Chellman, Dean, School of Health Services

Lawrence Tucker

Hpe 521 Advanced Seminar in Health and Safety 2 s.h.

This course provides the student with current health and safety information and defines its relation to the needs of the school child, the home, the community, and the school. It emphasizes the application of health and safety instruction to the modern principles of education, and provides the student with concrete materials to help plan and implement an effective health and safety instructional program. The course is geared toward the particular health and safety problems that relate to the students in the class. (Tucker, Miller)

Hpe 530 Workshop in Community School Health Education 2 s.h.

This workshop is concerned with school, community and public health as they relate to the interests of the workshop participants. Areas studied include mental health, nutrition, dental health, physical education, health services, environmental health, changing health patterns and health statistics. Teaching methods, special projects, consultations, visitations, discussions and sources of information and materials will be considered.

Credit for this workshop may be used in the general studies area of the elementary curriculum and, subject to the approval of the department chairman or program advisor, as an elective in all other programs. (Chellman, Tucker)

HISTORY

Clyde C. Gelbach, Chairman

Charles Cashdollar	Jane S. Mervine
Steven Cord	Larry C. Miller
Ronald Ferguson	Edgar Moore
Ernest B. Fricke	Robert L. Morris
Thomas D. Goodrich	James M. Oliver
John F. Kadlubowski	J. Merle Rife
Dale E. Landon	John R. Sahli
Neil B. Lehman	W. Wayne Smith
Irwin Marcus	Dorothy C. Vogel
Joseph Mastro	George T. Wiley

The Master of Arts Degree in History is designed to give students both breadth and depth in that academic discipline. As a terminal degree it prepares teachers for the secondary schools and community colleges. Scholarships and fellowship opportunities for work elsewhere beyond the master's degree should see the representative advising in this area. The Director of Graduate Studies within the department and adviser to graduate students is Dr. Irwin Marcus. All programs of study should be approved by him, or the departmental chairman.

It is imperative that graduate students schedule SS 510, Research Methodologies in the Social Sciences, early in their graduate program. This course must be completed before seminar work may be scheduled.

Students working toward the Master of Arts degree in History will complete a minimum of thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration (14-22 s.h.)

Hist	501	Historiography (Required)	2 s.h.
Hist	511	Readings in History	2 s.h.
Hist	512	Readings in History	2 s.h.
Hist	531	Economic and Social History of Pennsylvania	2 s.h.
Hist	532	U.S. - British Commonwealth Relations	2 s.h.
Hist	534	Recent U. S. History	2 s.h.
Hist	541	Modern European Problems	2 s.h.
Hist	542	Contemporary Latin American Problems	2 s.h.
Hist	543	Modern Asian - African Problems	2 s.h.
Hist	546	History of Europe, 1815-1914	2-3 s.h.
Hist	552	History of England to 1688	2-3 s.h.
Hist	553	History of England, 1688 to Present	2-3 s.h.
Hist	554	History of Russia to 1917	2-3 s.h.
Hist	555	History of Soviet Russia	2-3 s.h.
Hist	590	Social and Intellectual History of the United States to 1875	2-3 s.h.
Hist	591	Social and Intellectual History of the United States Since 1875	2-3 s.h.

II. Related Fields (0-8 s.h.)

Up to 8 s.h. in related fields may be elected by the student with the prior approval of his adviser or departmental chairman.

III. Research (8 s.h.)

The normal research requirement will involve SS 514, Research Methodologies in Social Science, and three history Seminars. Students who demonstrate special ability in a history seminar may, with the recommendation of the instructor, write a thesis carrying 2-4 additional

semester hours credit to complete the research requirement. Students attending the University on a full-time basis may request substitution of a course for one of the three seminars.

SS	514	Research Methodologies in Social Science (Required)	2 s.h.
Hist	521	History Seminar (Prerequisite)	2 s.h.
Hist	522	History Seminar (Prerequisite)	2 s.h.
Hist	544	History Seminar (Prerequisite)	2 s.h.
Grad	550	Thesis	2-4 s.h.

Course Descriptions

- Hist 501 Historiography** 2 s.h.
An introduction to the various schools of historical writing with some consideration of the leading practitioners. Required of all history M.A. candidates. (Staff)
- Hist 510 Community College Teaching Internship** 2 s.h.
A course designed especially to prepare Community College instructors through an emphasis on the objectives, materials, techniques and evaluation of general education programs in History. Summer only.
- Hist 511 Readings in History** 2 s.h.
Directed reading of significant historical materials, focused on a general topic. (Staff)
- Hist 512 Readings in History** 2 s.h.
Directed reading of significant historical materials, focused on a general topic. (Staff)
- Hist 521 History Seminar** 2 s.h.
Area research in the discipline, culminating in a formal paper. Prerequisite: SS 514.
- Hist 522 History Seminar** 2 s.h.
Area research in the discipline, culminating in a formal paper. Prerequisite: SS 514.
- Hist 531 Economic and Social History of Pennsylvania** 2 s.h.
This course considers the economic and social background of our state with an emphasis on regional development. The interplay of such factors as industrialization and immigration on organizational movements will be studied through the problem approach.
- Hist 532 U. S. - British Commonwealth Relations** 2 s.h.
Emphasis is placed on those aspects of United States and Commonwealth backgrounds and policies that aid mutual understanding and international accord in the modern world. (Gelbach)
- Hist 534 Recent U. S. History** 2 s.h.
A course devoted to an analysis of the fundamental changes in American culture since 1929. (Cord)
- Hist 541 Modern European Problems** 2 s.h.
A course area that considers Europe from the economic, social, political, diplomatic, and cultural points of view. Attention is also given to specific problems and to the role of European powers in world affairs. (Rife, Oliver, Vogel, Ferguson)
- Hist 542 Contemporary Latin American Problems** 2 s.h.
A study of the major cultural, economic, political, and related problems currently confronting the Latin American countries. (Moore)
- Hist 543 Modern Asian - African Problems** 2 s.h.
To understand better the nature and problems of a large portion of the non-Western world, the emphasis will be placed upon an analysis of con-

temporary, social, economic, and political developments in selected areas of Asia and Africa. (Goodrich)

Hist 544 History Seminar 2 s.h.

Area research in the discipline, considering various facets of a central problem. Prerequisite: Research Methodologies in Social Science. ((Staff)

Hist 546 History of Europe: 1815-1914 2-3 s.h.

A comprehensive study of the factors contributed by the European people in their national organization through their political, social, and economic activities. The understanding of these casual and intergroup relationships are basic to analysis and interpretations of the European world today. May not be programmed by students with undergraduate credit for History of Nineteenth Century Europe. (Oliver, Rife)

Hist 552 History of England to 1688 2-3 s.h.

A survey of the growth of the English nation with emphasis on the political, social, and economic developments leading to the 17th century conflict between Crown and Parliament. (Landon)

Hist 553 History of England, 1688 to Present 2-3 s.h.

A survey of the growth of England as a democratic constitutional monarchy. Attention is directed to the industrial revolution, and to imperial expansion, and to England's role in the 20th century world. (Wiley)

Hist 554 History of Russia to 1917 2-3 s.h.

A general survey of Russian history, culture, and institutions. Special consideration is given to the study of those historical forces which were formative of the Revolution in 1917. (Kadlubowski)

Hist 555 History of Soviet Russia 2-3 s.h.

A general survey of contemporary Soviet history, culture, and institutions. Special consideration is given to the study of communist theory and its place in current Russian historiography. (Kadlubowski)

Hist 590 Social and Intellectual History of the United States to 1875 2-3 s.h.

A study of the social and intellectual factors which helped to shape the nation up to the time of Henry George. (Cashdollar)

Hist 591 Social and Intellectual History of the United States Since 1875 2-3 s.h.

An analysis of the cultural forces which have helped to shape modern America. Ways of living characteristic of certain periods will be studied, together with the more significant social-reform movements and their attendant systems of thought. (Cashdollar)

HOME ECONOMICS EDUCATION

Louise Fernandez, Chairman

Ruth Anderson

Patricia Bell

Kathleen Jones

Yu-Chen Liu

Satya Sharma

The Graduate Program in Home Economics Education leads to a Master of Education Degree. The program is designed for students who wish to take advanced work beyond the bachelor's degree and to become better qualified for home economics education positions in teaching and supervision.

For admission into this curriculum a student must have completed a baccalaureate degree in home economics with major in home economics education or with a minimum of 36 semester hours of home economics, 19 semester hours in education, including home economics education and student teaching, and a minimum of 3 semester hours in educational psychology. The degree must be from an approved institution.

Each student admitted to the Graduate School will be assigned a faculty adviser by the Chairman of the Department. This adviser will help the student plan his program of study. Any deviation from the degree requirements shall have the written approval of the adviser and the Department Chairman.

A thesis or a research project is required. The selection of and the proposal for the research shall be approved by the adviser and other members of the student's Graduate Committee. The research shall be carried on by the student under the direction of the research adviser and committee members.

Grad 515 should be scheduled early in the student's program. HE 578V should be scheduled soon after taking Grad 515 and preferably after two or more courses in Home Economics Education are completed.

CURRICULUM FOR THE MASTER OF EDUCATION DEGREE

Students working for this degree will complete thirty (30) or more semester hours of work. Courses should be selected in accordance with the following divisions:

- I. Subject Matter Concentration—eight (8) or more semester hours from two or more phases of home economics to be selected from the following or other courses approved by adviser:

Clothing and Textiles

HE	530	Clothing and Human Behavior	2 s.h.
HE	531	Creative Clothing	2 s.h.
HE	532	Recent Developments in Textiles	2 s.h.
°HE	597	European Study Tour in Textiles and Clothing	2-6 s.h.

Foods and Nutrition

HE	540	Advanced Human Nutrition	2 s.h.
HE	541	Advanced Foods and Gourmet Cookery	2 s.h.
HE	542	Contemporary Issues in Foods and Nutrition	2 s.h.
°HE	598	Oriental Study Tour in Foods	2-6 s.h.
°HE	599	European Study Tour in Foods	2-6 s.h.

Home Management and Family Economics

HE	551	Seminar in Home Management and Family Economics	2 s.h.
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Housing

HE	560	Problems in Housing and Interior Design	2 s.h.
HE	561	Household Equipment and Appliances	2 s.h.

Human Development and the Family

HE	521	Problems in Family Living	2 s.h.
HE	522	Seminar in Human Development	2 s.h.
HE	523	Field Work in Family Life or Human Development	2 s.h.
*HE	596	Study Tour in Oriental Family Life	2-6 s.h.

*Two to four (2-4) hours of tour courses in one area may apply toward degree requirements.

II. Research Techniques—The following course is required. It should be scheduled very early in the student's program.

Grad	515	Elements of Research	2 s.h.
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III. Foundations of Education—One course must be selected from these offerings:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundation of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Thesis or Research Project—A thesis or research project is required of each student. The thesis may earn two hours credit.

Grad	550	Thesis	2 s.h.
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A research project fulfills this requirement, but does not earn any semester hour credit.

V. Home Economics Education—ten (10) or more semester hours to be selected from the following or other approved courses:

HE	570V	Vocational Education—Home Economics in American Education	2 s.h.
**HE	571V	Curriculum Development in Home Economics	2 s.h.
HE	572V	Evaluation in Home Economics	2 s.h.
HE	573V	Supervision and Administration in Home Economics Education	2 s.h.
HE	574V	Seminar in Home Economics Education	2 s.h.
HE	575V	Home Economics in Higher Education	2 s.h.
HE	577V	Independent Study in Home Economics Education	2 s.h.
**HE	578V	Research in Home Economics Education	2 s.h.

**Required

VI. General Studies—two (2) or more semester hours of work to be selected from the courses listed below or from others approved by his adviser:

Art	521	Contemporary Movements in Art	2 s.h.
Art	522	Art in America	2 s.h.
Art	543	Exhibition Techniques	2 s.h.
Art	544	Graduate Studio in Fabrics I	2 s.h.
Art	545	Graduate Studio in Fabrics II	2 s.h.
Art	546	Graduate Studio in Fabrics III	2 s.h.
Bus	570	Economic Background of Business	2 s.h.
Eng	512	American English Grammar	2 s.h.
Eng	531A	Major Writers: Emerson, Hawthorne and Thoreau	2 s.h.
Eng	534	Types of Novel	2 s.h.
Eng	537	Modern American Fiction	2 s.h.
Math	521	Basic Concepts in Mathematics	2 s.h.
Mus	521	Music Literature and Materials	2 s.h.
Phil	581	Problems in Logic	2 s.h.
Phil	582	Problems in Ethics	2 s.h.
Phil	583	American Philosophic Thought	2 s.h.
SS	521	Contemporary American Issues	2 s.h.
SS	561	Social Policy Studies	2 s.h.
Soc	565	Adolescent in American Society	2 s.h.

HOME ECONOMICS COURSES

Clothing and Textiles

HE 530 Clothing and Human Behavior 2 s.h.

Emphasis is placed on understanding factors affecting clothing decisions of differing individuals and families. Cultural, social, psychological and economic influences are considered. Concepts from anthropology, sociology, psychology and economics are explored in studying the relation of clothing to human behavior.

HE 531 Creative Clothing 2 s.h.

Factors that influence clothing design and sources of design inspiration are investigated. Lines, shapes, colors and textures are studied in relation to the creation of clothing to fit the human body. The effects of fabric finishes, drapability, and dimensional stability on design are explored. Two major projects required.

HE 532 Recent Developments in Textiles 2 s.h.

This course is designed to acquaint the student with new developments in textiles as they affect the consumer. Emphasis is placed on understanding factors involved in the selection, use, and care of new fibers, fabrics, and finishes.

HE 597 European Study Tour in Clothing and Textiles 2-6 s.h.

Provides visits to European establishments concerned with the production of textiles and apparel. Historic costumes and textiles, including some of the world-famous tapestries are viewed. Fashion houses, designer salons, textile mills, apparel industries, cottage industry centers, retail stores, and museums are visited. Both traditional and modern methods of clothing and textile production are observed.

Foods and Nutrition

HE 540 Applied Human Nutrition 2 s.h.

Nutritional needs and problems occurring at different stages in the life cycle are studied: pregnancy, infancy, early childhood, adolescence, aging.

HE 541 Advanced Foods—Gourmet Cookery 2 s.h.

The course is an investigation, analysis, and interpretation of the art and science of cooking as influenced by historical, racial, religious and social customs. Both foreign and domestic gourmet cookery are studied. Laboratory experiences are a part of the course.

HE 542 Contemporary Issues in Foods and Nutrition 2 s.h.

Contemporary issues in foods and nutrition are reviewed and analyzed. Current information is evaluated for its reliability.

HE 598 Oriental Study Tour in Foods 2 s.h.

A comprehensive program of directed activities provides opportunity for students to gain first-hand knowledge of the growing, processing and preparation of oriental foods. Significant phases of the history and culture of the people of oriental lands as related to food are studied.

HE 599 European Study Tour in Foods 2 s.h.

European foods are studied in relation to cultural, economic, and religious influences. The tour provides the opportunity to see food markets, processing plants, food stores, catering schools, research centers, and chef's training schools. Lectures and demonstrations are given by food experts. Famous restaurants where typical European food is served are visited.

Home Management and Family Economics

HE 551 Seminar in Home Management and Family Economics 2 s.h.

Newer concepts and developments in the areas of home management and family economics are studied. Recent research in these fields is reviewed.

Topics discussed include: socioeconomic factors, family wants and resources, decision-making, and improving family consumption patterns.

Housing and Interior Design

HE 560 Problems in Housing and Interior Design 2 s.h.

The influences which contribute to the design of the modern home and its furnishings are investigated. Housing needs are studied in relation to stages in the family-life cycle.

HE 561 Household Equipment and Appliances 2 s.h.

Modern appliances and household equipment are studied in terms of materials used, methods of construction, and principles of operation and care. Various appliances are evaluated for their efficiency and usefulness.

Human Development and the Family

HE 521 Problems in Family Living 2 s.h.

Emphasis is placed on solving problems created by social change. New knowledge from science, medicine, sociology, economics, art, and psychology is utilized to improve family living. Problems concerned with food, clothing, shelter, management, and family relationships are investigated. (Open to majors and non-majors.)

HE 522 Seminar in Human Development 2 s.h.

Pertinent literature dealing with aspects of human development is critically reviewed and analyzed. An intensive study of a selected topic or problem related to human development is required of each student. (Permission of instructor for non-majors.)

HE 523 Field Work in Family Life or in Human Development 2 s.h.

This course is designed to study individual and family interaction. Methods of working with various types of families through an analysis of research, scientific literature, and community programs are studied. Advanced graduate students plan and participate in laboratory-type work with individual families. (Permission of instructor for non-majors.)

HE 596 Study Tour in Oriental Family Life 2 s.h.

This tour offers the opportunity to observe the oriental family social structure and values in relation to the cultural background and economic conditions. Culture, class, and ethnic variations in the family and kinship systems are examined, emphasizing the relationships to international relations and family life education.

HOME ECONOMICS EDUCATION

HE 570V Home Economics in American Education 2 s.h.

The present status of home economics is reviewed in terms of the history and philosophy of the profession. The role and contribution of home economics in relation to the total educational program at the elementary, secondary, post secondary, and higher education levels is discussed. Trends and issues critical to the future of home economics are investigated.

HE 571V Curriculum Development in Home Economics Education 2 s.h.

The various tasks and processes of curriculum development are reviewed and analyzed. Special attention will be given to making realistic curriculum decisions and using innovative procedures in developing the home economics curriculum.

HE 572V Evaluation in Home Economics 2 s.h.

A study of the nature and scope of evaluation in contemporary home economics programs. A variety of evaluative methods and techniques designed to measure a comprehensive range of home economics educational objectives are studied. Special attention is given to the use and construction of teacher-made tests and evaluative devices.

HE 573V Supervision and Administration in Home Economics Education 2 s.h.

This course deals with the principles, methods, and techniques of supervision in home economics education. Special attention is given to basic concepts in supervision such as human relations, the communication process, decision-making, leadership strategies, and the role of action-research in improving school practices in home economics.

HE 574V Seminar in Home Economics Education 2 s.h.

The student plans and conducts an intensive investigation and analysis of the major literature and research related to a selected topic or problem. Selected educational problems are dealt with through evaluation and interpretation of current and classical research in areas such as:

- | | |
|------------------------|---|
| A. Curriculum | G. Administration |
| B. Teaching | H. Philosophy |
| C. Learning | I. Extended Employment and Home Experiences |
| D. Youth Organizations | J. Contemporary Home Economics Learning Centers |
| E. Evaluation | |
| F. Supervision | |

HE 575V Home Economics in Higher Education 2 s.h.

Contemporary programs of home economics at the college level are studied and evaluated in terms of major issues, trends, and problems in higher education and professional home economics. Problems of curriculum development, effective teaching, guidance, and evaluation are emphasized.

HE 577V Independent Study in Home Economics Education 2 s.h.

Students select one or more current problems or significant topics in home economics education for investigation and meet with assigned staff member for guidance and supervision. Independent reading, study, analysis, and evaluation are emphasized. Where appropriate, special attention will be given to the use of research methods and experimentation in problem solving. (Registration only by permission of Department Chairman.) Prerequisite HE 571V.

HE 578V Research in Home Economics Education 2 s.h.

Reports by home economics, behavioral science, and education researchers are analyzed and evaluated. Methodology introduced in Grad 515 is studied further in terms of home economics research problems. This course is designed to assist the student in defining his own research problem or thesis. This course shall not be scheduled before Grad 515. Prerequisite HE 571V.

LEARNING RESOURCES AND MASS MEDIA

Curriculum for Certification as a Learning Resources Specialist

Norman W. Sargeant, Chairman

Lawrence D. Bergman

Richard H. Madden

Edward Hauck

Daniel V. Mattox, Jr.

Merle G. Klinginsmith

William E. McCavitt

Donald M. MacIsaac

J. Robert Murray

The graduate program in Learning Resources and Mass Media is designed primarily to offer the student certification as a Learning Resources Specialist. Certificates will be granted to students who complete the following requirements:

1. Hold a permanent college certificate valid for elementary or secondary education.
2. Complete 24 semester hours of graduate work in the curriculum of Learning Resources and Mass Media and related subjects as outlined in the curriculum for certification as a Learning Resources Specialist.

Any student seeking permanent college certification and/or working toward a Master's degree within the graduate school may, with the approval of his adviser, his department chairman, and the chairman of the Department of Learning Resources and Mass Media, elect up to ten semester hours from the Learning Resources curriculum. These credits may then be applied toward certification as a Learning Resources Specialist. Students not in the educational profession (i.e., business or industry) and who otherwise meet the admission requirements for graduate school may pursue the program for Learning Resources Specialist and upon completion of the requirements may be granted a special Certificate of Proficiency by the University.

A student who presents proof of competency in one or more of the basic courses in the curriculum may, with the approval of his adviser, and the department chairman, elect another course from the Learning Resources curriculum or from some other curriculum in the University. Up to six of the 24 hours required for certification must be taken as an internship program as approved by the University.

For the student to become competent for this certification, he, in conjunction with his adviser, the department chairman, and the Dean of the Graduate School, will select a balance of courses from the following areas:

1. Learning theory relative to learning resources and communications (LRes 500-515)
2. Fundamentals of library science (LRes 530)
3. Production and utilization of learning resources (LRes 540-551)
4. Organization and operation of learning resources centers (LRes 560-569)

LRes 500 Seminar in Learning Resources

2 s.h.

An introductory course to the area of Learning Resources. Major emphasis will be placed upon the differences among learning materials learners and teaching methods. The student will have the opportunity to do literary research for a better understanding of how Learning Resources are related to the learning process in our modern society. (Murray, Sargent)

LRes 501 The Classroom Use of Motion Pictures

2 s.h.

Develops a basis for the critical evaluation of films for various educational purposes. Emphasis will be placed upon an understanding of production techniques, stereotypes, prejudices, and misconceptions which influence the quality of educational films, and upon the methods of selection, acquisition, evaluation and distribution of films. (MacIsaac)

- LRes 502 Programmed Learning in Education** 2 s.h.
Will cover historical development, theory and philosophy, audio instructional equipment, programmed texts, theories of programming, types of programs available, analysis and evaluation of research. (Sargent)
- LRes 503 Writing for A-V Production** 2 s.h.
Provides an introduction to script writing for films and filmstrips. Various styles and techniques of writing will be analyzed and each student will be expected to experiment with the techniques presented. Emphasis will be placed on writing and upon criticism, in class, of student scripts. (McCavitt)
- LRes 504 Foundations of Broadcasting** 2 s.h.
An examination of the historical, legal, and economic aspects of modern broadcasting. Extensive readings in fundamental theory and a study of current station and network practices, educational as well as commercial. (McCavitt)
- LRes 505 Role of Learning Resources in Broadcasting** 2 s.h.
A study of the effective use of learning resources for the most beneficial learning situations in radio and television broadcasting. Will give the student the opportunity to concentrate on the theory of communication, psychology of audience variability, picture primary, protagonist prestige, level of verbalization, etc. (McCavitt)
- LRes 506 Evaluation of Research in Educational Effectiveness of Mass Media** 2 s.h.
Will offer the opportunity to examine and evaluate the research and research findings of significant studies and summaries of studies in areas of mass media. Only the educational implications of the studies will be considered. Students may have the opportunity to concentrate upon one area of interest, as motion pictures, television, radio, journalism, etc. (Staff)
- LRes 507 Seminar of Current Problems in Broadcasting** 2 s.h.
An examination of current developments in the field. The national press and trade publications are used as texts and some experience is given in locating the sources of much needed and frequently used television information. (McCavitt)
- LRes 508 Advanced Techniques in Utilization of Learning Laboratories** 2 s.h.
Will investigate the use of language labs in all areas of the curriculum, the use of dial access retrieval systems, computer based instruction, and other self-instructional techniques. (Staff)
- LRes 509 Programming of Multi-Media Materials** 2 s.h.
Will investigate practical ways of combining a variety of media into an effective teaching-learning situation. (Sargent)
- LRes 515 Role of Learning Resources—Theoretical and Research Foundations** 2 s.h.
Examines the role of perception as pertains to sensory experiences and inner cognitive processes in relationship to maturation, goals and drives, and environment. Seeks to relate psychological processes to learning resources, with emphasis on the newer media. (Staff)
- LRes 530 Classification and Cataloging of Learning Resources** 2 s.h.
Principles of classifying and cataloging learning resources, such as motion pictures, video tapes, filmstrips, slides, transparencies, disk and tape recordings, microfilm, microcard and microfiche, flat pictures, etc. For learning resources administrators and librarians. (Library staff)
- LRes 540 Preparation of Learning Resources** 2 s.h.
Introductory course to the preparation of a wide variety of classroom materials, in which building coordinators, as well as others, can assist teachers

—lettering, coloring, mounting, bulletin boards, feltboards, and the preparation of pictures, maps, posters, charts and graphs for projected and non-projected use. (Staff)

LRes 541 Photographic Fundamentals for Educational Materials 2 s.h.

Emphasis will be placed on the use of the still picture camera and the darkroom for instructional purposes, the making of b/w negatives, 35mm slides, copywork, developing b/w and color film, and b/w contact printing and enlarging. Each student must furnish his own 35mm camera and an acceptable exposure meter. No previous photographic experience is necessary. (Staff)

LRes 542 Preparation of Transparencies 2 s.h.

Covers the various methods of producing transparencies larger than 35 mm slides starting with the Polaroid system for 3½ x 4" slides as well as regular photography; the use of photocopying machines; addition of color using a variety of materials and techniques; methods of lettering; techniques in transferring printed materials to transparencies; and the latest techniques and materials available in this area of production. (Staff)

LRes 543 Slide and Filmstrip Production for Education 2 s.h.

Prerequisite: Photographic Fundamentals. This course emphasizes the techniques of color and b/w slide preparation, duplication, titling and binding; it will introduce the techniques necessary to produce color filmstrips on a commercial basis, and students will participate in the making of a filmstrip through all stages, from script to screen. Techniques for making home-made filmstrips will also be explored. Each student must furnish his own 35mm camera, and an acceptable exposure meter. (Staff)

LRes 544 Beginning Cinematography for Education 2 s.h.

Emphasis will be placed on the effective use of the motion picture camera and editing tools to make useful, locally produced teaching films. No previous experience is necessary, but the student should own or have access to an 8mm or 16mm camera, and an acceptable exposure meter. (MacIssac)

LRes 545 Advanced Motion Picture Production for Education 2 s.h.

Prerequisite: Beginning Motion Picture Production. This course will emphasize production planning for motion pictures, directing, advanced picture and sound editing techniques, and the use of sound recording and laboratory facilities. In addition to live action cinematography titling, animation, and special effects photography will be investigated. (MacIssac)

LRes 546 Motion Picture Production Workshop 2 s.h.

Prerequisites: Beginning Cinematography, Advanced Cinematography, and Writing for A-V Production. Students will work as a team to shoot, edit, and sound a 16mm motion picture under the supervision of the instructor. Each student will have the opportunity to work variously as cameraman, assistant cameraman, director, assistant director, unit manager, sound recordist, script secretary, editor, mixer, etc. (Staff)

LRes 547 Animation 2 s.h.

Introduces a variety of motion picture animation techniques and offers practical experience in planning and carrying out the production of animated sequences. A wide variety of films will be viewed and discussed; experimentation in class and through projects with filmograph, cut-out animation, puppet animation, and full cell animation. Practice in designing, drawing, tracing, inking, and printing cells; preparation of blackboards, use of cell-boards, animation camera and animation stand; preparation of story boards and cue sheets; integration of visual and sound. (MacIsaac)

LRes 548 Writing for Radio and Television 2 s.h.

For teachers, school administrators, and non-school persons interested in public service, non-professional, or educational broadcasting. Presents theory and practice in planning, writing, and producing various kinds of

programs for listeners in and out of schools. Educational and/or radio experience is desirable but not required. (McCavitt)

LRes 549 Television Production and Direction 2 s.h.

An intensive laboratory course using closed circuit facilities designed to develop skills in program production and direction. Theory and practice of production is examined with each student expected to produce a television program during the course. (McCavitt)

LRes 550 Advanced Audio Recording Techniques 2 s.h.

Theory and practice of recording sound for motion pictures, video tapes, audio tapes, sound filmstrips, etc. Will use sound on sound and other special recording techniques. (Staff)

LRes 551 Advanced Techniques in Transparency Production 2 s.h.

Will provide opportunities to design and produce complex multicolor transparencies and simulated motion through specialized techniques. (Staff)

LRes 560 Management of Learning Resources Program 2 s.h.

Considers the problems in setting up and managing an integrated program, including production, selection, utilization, and management of Learning Resources Centers; problems of finance; function and organization of the different services; relationships among school systems, colleges, and community and adult groups; and evaluation standards for the various services. (Murray)

LRes 568 Research Methods and Theory in Learning Resources 2 s.h.

Examines research techniques for application to investigations in the areas of learning resources administration, analysis of media content and audience characteristics, and effects of educational and commercial communications. Also will consider problems in writing proposals for federal research grants and for ESEA grants. (Staff)

LRes 569 Internship Program of Learning Resources Specialists 2-6 s.h.

A program in which a candidate would work in a carefully planned variety of roles in a comprehensive regional learning resources center or similar situation, television broadcasting or closed-circuit facility, motion picture production agency, programmed learning development organization, learning resources workshop program, little theater group, major museum or approved equivalent, under competent university and agency supervision, and would be rated by both the cooperating agency and the University.

MATHEMATICS

Melvin R. Woodard, Chairman

Joseph S. Angelo	Marlin E. Hartman	Dale M. Shafer
Ida Z. Arms	John P. Hoyt	Maher U. Shawer
John Broughton	Charles Maderer	Jack L. Shepler
John F. Busovicki	Doyle R. McBride	William R. Smith
Gerald Bunok	Ronald E. McCoy	Elwood R. Speakman
Blaine Crooks	Wallace F. Morrell	Merle E. Stilwell
Arlo Davis	Carl P. Oakes	Halley O. Willison
Donald D. Duncan	Joseph A. Peters	Richard E. Wolfe
Raymond D. Gibson	William Rettig	

The degrees offered by the Department of Mathematics are the Master of Education with a major in mathematics and the Master of Science.

Each student admitted to the Graduate School will be assigned an adviser in the Mathematics Department. All courses must be approved by the adviser.

As soon as the research course is completed, a student should request from the Chairman of the Mathematics Department that a research adviser be assigned. The adviser will likely be a different person than the course adviser.

Master of Education Degree

Students working for this degree with a major in Mathematics will complete a minimum of thirty (30) semester hours of work in accordance with the following divisions:

- I. Subject Matter Concentration Area—fourteen to twenty-two (14-22) semester hours of work in subject matter content are to be selected from the following courses in which the student must take at least one two-semester sequence from each of "Analysis" (other than Math 529-530) and "Algebra"; and at least one course from each of the headings, "Geometry" and "Additional Courses."

ANALYSIS

Math 529	Differential Equations	2 s.h.
Math 530	Partial Differential Equations	2 s.h.
Math 531	Advanced Calculus I	2 s.h.
Math 532	Advanced Calculus II	2 s.h.
Math 533	Functions of a Complex Variable I	2 s.h.
Math 534	Functions of a Complex Variable II	2 s.h.
Math 535	Functions of a Real Variable I	2 s.h.
Math 536	Functions of a Real Variable II	2 s.h.
Math 539	Infinite Series I	2 s.h.
Math 540	Infinite Series II	2 s.h.
Math 543	Vector Analysis I	2 s.h.
Math 544	Vector Analysis II	2 s.h.

ALGEBRA

Math 552	Number Theory	2 s.h.
Math 561	Abstract Algebra I	2 s.h.
Math 562	Abstract Algebra II	2 s.h.
Math 563	Linear Algebra I	2 s.h.
Math 564	Linear Algebra II	2 s.h.
Math 565	Theory of Groups	2 s.h.

GEOMETRY

Math 571	Modern Geometry I	2 s.h.
Math 572	Modern Geometry II	2 s.h.
Math 575	Projective Geometry I	2 s.h.
Math 576	Projective Geometry II	2 s.h.

ADDITIONAL COURSES

- | | | | |
|------|-----|----------------------------|--------|
| Math | 570 | Point Set Theory | 2 s.h. |
| Math | 573 | Topology I | 2 s.h. |
| Math | 574 | Topology II | 2 s.h. |
| Math | 580 | Logic | 2 s.h. |
| Math | 582 | Theory of Probability | 2 s.h. |
| Math | 584 | Mathematical Statistics I | 2 s.h. |
| Math | 585 | Mathematical Statistics II | 2 s.h. |
- II. Professional Studies—four to 10 (4-10) semester hours of work, including Research Paper or the Thesis, to be selected from the following:
- | | | | |
|------|-----|---|----------|
| LRes | 500 | Seminar in Learning Resources | 2 s.h. |
| Grad | 517 | Statistical Methods in Ed. II
(with approval of adviser) | 2 s.h. |
| Grad | 550 | Thesis | 2-4 s.h. |
| Psy | 531 | Psychology of the Exceptional Child | 2 s.h. |
| Psy | 532 | Studies in Pupil Adjustment | 2 s.h. |
| Math | 510 | Seminar in Mathematics I
(Jr. H. S. Mathematics) | 2 s.h. |
| Math | 511 | Seminar in Mathematics II
(Sr. H. S. Mathematics) | 2 s.h. |
- III. Foundations of Education—two (2) semester hours of work to be selected from the following courses:
- | | | | |
|----|-----|--|--------|
| Ed | 511 | Historical Foundations of Education | 2 s.h. |
| Ed | 512 | Philosophical Foundations of Education | 2 s.h. |
| Ed | 513 | Social Foundations of Education | 2 s.h. |
- IV. Research Techniques—the following course is required. It should be scheduled early in the student's program:
- | | | | |
|------|-----|------------------------------------|--------|
| Math | 600 | Methods of Research in Mathematics | 2 s.h. |
|------|-----|------------------------------------|--------|
- V. Elective Courses—Cannot count in minimum requirements of concentration area but may count toward degree.
- | | | | |
|------|-----|--|--------|
| Math | 501 | Digital Computer Programming (FORTRAN) | 2 s.h. |
| Math | 502 | Digital Computers and Compiler Systems | 2 s.h. |
| Math | 503 | Seminar: Computer Applications in Research | 2 s.h. |
| Math | 507 | Numerical Analysis | 2 s.h. |

Master of Science

The major purpose of this degree is to provide the students with a rigorous course of training in graduate level mathematics (1) which can be used as preparation for advanced degrees, or (2) which can be used as basic preparation for specialization in applied mathematics, or (3) for a terminal degree in mathematics.

After the course Research Methods in Mathematics has been completed, each student should request a research adviser from the Chairman of the Mathematics Department. This adviser may be a different person than the course adviser.

Students working for this degree will complete thirty (30) credit hours of work in accordance with the following plan:

- I. Subject Matter Concentration Area 18-26 s.h.
 Students must successfully complete 14 s.h. of work in mathematics courses as follows:
- | | | | |
|------|---------|--------|-----------------------------------|
| Math | 531-532 | 4 s.h. | Advanced Calculus I and II |
| Math | 533 | 2 s.h. | Functions of a Complex Variable I |
| Math | 561-562 | 4 s.h. | Abstract Algebra I and II |
| Math | 563-564 | 4 s.h. | Linear Algebra I and II |

If some of these courses have been completed satisfactorily by a student in his undergraduate preparation, then a suitable higher level course

in the same area should be substituted, as approved by the student's faculty adviser.

In addition to the above courses, students must complete at least two of the following courses. In the case of a level II course, it is to be understood that the level I course has already been successfully completed either at the undergraduate or graduate level. Credit for the level I course taken as a graduate course will be given toward the required number of s.h. for the degree, with the approval of the faculty adviser.

Math 530	2 s.h.	Partial Differential Equations
Math 534	2 s.h.	Functions of a Complex Variable II
Math 565	2 s.h.	Theory of Groups
Math 574	2 s.h.	Topology II
Math 576	2 s.h.	Projective Geometry II
Math 585	2 s.h.	Mathematical Statistics II

Following is a list of all courses offered by the Mathematics Department that will be accepted as credit toward the M.S. Degree.

Math 501, 502, 503		Computer Courses
Math 507	2 s.h.	Numerical Analysis
Math 529-530	4 s.h.	Differential Equations and Partial Differential Equations
Math 531-532	4 s.h.	Advanced Calculus I and II
Math 533-534	4 s.h.	Functions of a Complex Variable I and II
Math 535-536	4 s.h.	Functions of a Real Variable I and II
Math 539-540	4 s.h.	Infinite Series I and II
Math 543-544	4 s.h.	Vector Analysis I and II
Math 552	2 s.h.	Number Theory
Math 561-562	4 s.h.	Abstract Algebra I and II
Math 563-564	4 s.h.	Linear Algebra I and II
Math 565	2 s.h.	Theory of Groups
Math 573-574	2 s.h.	Topology I and II
Math 575-576	4 s.h.	Projective Geometry I and II
Math 580	2 s.h.	Logic
Math 582	2 s.h.	Theory of Probability
Math 584-585	4 s.h.	Mathematical Statistics I and II
Math 690	2-6 s.h.	Research Problems in Mathematics

II. Related Studies 0-4 s.h.

A maximum of 4 s.h. in courses offered by departments other than the mathematics department, but related to it, may be credited toward the M.S. Degree with permission of the faculty adviser.

III. Research Requirement 2-6 s.h.

All students must take Math 600 at or near the completion of the basic 14-hour sequence listed in Part I of the degree description. Upon completion of Math 600, the student has the option of writing a research project for no credit, or a thesis for 2-4 credits.

Course Descriptions

Math 501 Digital Computer Programming (FORTRAN) 2 s.h.

Principles of programming electronic digital computers; development of programs in the FORTRAN language; compilation and execution on College computer.

Math 502 Digital Computers and Compiler Systems 2 s.h.

Development of digital computers; description of present-day computers and the symbolic programming and compiler systems available for program development. Prerequisite: Math 501.

Math 503 Seminar: Computer Applications in Research 2 s.h.

Description of general techniques to facilitate processing of research data on a digital computer; special attention to individual research problems of class members.

Math 507 Numerical Analysis 2 s.h.

This course is concerned with techniques of employing computers to solve problems. The topics covered will include approximation of functions by Taylor Series, iterative methods of solving equations, solutions of systems of equations, interpolation, numerical differentiation and integration, and numerical solution of ordinary differential equations.

Math 510 Seminar in Mathematics I
(Junior High School Mathematics) 2 s.h.

This course will acquaint the student with recommended curricula for the 7th, 8th, and 9th grades in Mathematics. Emphasis will be placed on programs for the slow, the average, and the gifted learners. Students will work on individual projects. Prerequisite: Permission of instructor. (Does not apply toward requirements for the M.S. Degree.)

Math 511 Seminar in Mathematics II
(Senior High School Mathematics) 2 s.h.

This seminar will acquaint the student with recommended curricula for the 10th, 11th, and 12th grades in Mathematics. Emphasis will be placed on updating curricula. Special attention will be given to teaching topics of equations, inequalities, sets, functions, relations, and a modern approach to the teaching of geometry and trigonometry at the secondary school level. Prerequisite: Permission of instructor. (Does not apply toward requirements for the M.S. Degree.)

Math 529 Differential Equations 2 s.h.

This course is designed to bridge the gap between the elementary theory of differential equations and the study of advanced techniques. It provides a vigorous survey of those topics which are most useful in the exact sciences. Some of the topics covered in this course are: an introduction to phase-plane analysis of non-linear oscillations, numerical integration and difference approximations, and Sturm-Liouville systems. Prerequisites: An undergraduate course in differential equations and advanced calculus, or their equivalents.

Math 530 Partial Differential Equations 2 s.h.

This course deals with linear partial differential equations of the second order, with equations solvable by separation of variables and with approximation methods of solution. Numerous applications from engineering and the physical sciences are included in the course. Prerequisites: Advanced Calculus, Ordinary Differential Equations (one semester of each).

Math 531-532 Advanced Calculus I, II 4 s.h.

These courses are the basis for advanced analysis. Topics include structure of the real number system, functions, sequences, limits, continuity, differentiation, integration, infinite series of constants, and power series.

Math 533-534 Functions of a Complex Variable I, II 4 s.h.

These courses include a study of the properties of complex numbers and functions, including: analytic and elementary functions, the Cauchy-Goursat integral theorem, contour integrals, power series, residues and poles, conformal mappings, Schwarz-Christoffel transformation, and analytic continuation. Prerequisite: Math 531.

Math 535-536 Functions of a Real Variable I, II 4 s.h.

These courses develop further the topics of Math 531 and 532. Point sets, uniform continuity, Stieltjes integration, uniform convergence, and functions of several variables are among the topics discussed. Prerequisite: Math 532.

Math 539-540 Infinite Series I, II 4 s.h.

A development of the theory of the convergence of series. Among the topics considered are: sequences; series of positive, arbitrary, and variable terms; double series, power series, types of convergence and the associated operations with series. Prerequisite: Math 532.

Math 543-544 Vector Analysis I, II 4 s.h.

These courses will include the algebra and calculus of vectors with application to various physical and geometrical problems. Definitions of line and surface integrals and their application to special physical and engineering problems will be included. Prerequisite: Differential and Integral Calculus.

Math 552 Number Theory 2 s.h.

Topics considered will include: elementary properties of integers, Euclidean algorithm, Prime Numbers, Divisibility, Congruences, Residues and Diophantine equations. Prerequisite: Differential and Integral Calculus.

Math 561-562 Abstract Algebra I, II 4 s.h.

This course is designed to continue the study of the axiomatic structure of algebra to which the student has been introduced in previous courses. This will consist of an intensive study of the properties of groups, rings, ideals, integral domains and fields. Vectors and vector spaces, the theory of matrices and linear transformations, linear spaces and linear and bi-linear forms will be studied.

Math 563-564 Linear Algebra I, II 4 s.h.

Theory of vector spaces and linear transformations. Matrices and determinants. Introduction to linear algebras.

Math 565 Theory of Groups 2 s.h.

Abstract group theory with emphasis on finite groups, quotient groups as a basis for Galois Theory, derived groups, nilpotence, extension, and products will be considered. Prerequisite: Math 561.

Math 570 Point Set Theory 2 s.h.

This course is a study of the basic concepts of set theory. The course includes a brief discussion of logic and proof followed by the essentials of set theory, the set approach to relations and functions, finite and infinite sets, and cardinal and ordinal numbers. This course serves as a partial basis for advanced courses.

Math 571-572 Modern Geometry I and II 4 s.h.

A systematic analysis of geometry through a study of axiomatic, synthetic and analytic projective geometry. Affine, Euclidean, and non-Euclidean geometries are obtained by successive restrictions of projective transformations.

Math 573-574 Topology I, II 4 s.h.

An introduction to point set topology and those properties of topological spaces invariant under homeomorphisms such as compactness, connectedness, etc.

Math 575-576 Projective Geometry I, II 4 s.h.

Discussions will concern: projection and section, ideal elements, projectively related forms, harmonic sets and resulting metric properties, polarity, involution, and conic sections from a projective standpoint.

Math 580 Logic 2 s.h.

An introduction to symbolic logic, including quantification theory, and its value in determining the validity of mathematical arguments.

Math 582 Theory of Probability 2 s.h.

This course develops probability theory as a mathematical model. The models studied are: Bernoulli, binomial, Poisson and normal. Distributions of sums of independent random variables are derived by means of probability

and moment generating functions. One form of the central limit theorem is derived. Numerous practical illustrations are supplied. Prerequisite: Differential and Integral Calculus.

Math 584 Mathematical Statistics I **2 s.h.**

The science of statistics is presented as decision theory, where, for the most part, decisions are made concerning populations as a result of incomplete sample data. This course deals with estimation of population parameters and testing hypotheses about populations. The populations used for study are those described in the description of Math 582. In addition, the Chi-square distribution is derived. Except where exact distributions are already known, this course, concerns itself with large sample theory. Numerous practical illustrations from different fields are supplied. Prerequisite: Math 582 or its equivalent.

Math 585 Mathematical Statistics II **2 s.h.**

This course is a continuation of Math 584. Student's t and the F distribution are derived for use in small sample testing. Correlation and regression are studied via the bivariate normal distribution. An introduction to analysis of variance and some nonparametric methods of testing hypotheses are presented. Numerous practical illustrations from different fields are supplied. Prerequisite: Math 584.

Math 600 Methods of Research in Mathematics **2 s.h.**

The purpose of this course is to acquaint students with the mathematical literature and to develop skill in the use of this literature. A proposal for independent study or research will be required. (Formerly Math 590)

Math 690 Research Problems in Mathematics **2-6 s.h.**

An individual study under the guidance of a faculty member in some area of mathematics which has not been studied in the student's regular courses. (Formerly Math 591-593)

Grad 550 Research and Thesis **2-10 s.h.**

MATHEMATICS FOR THE ELEMENTARY SCHOOL TEACHER

Willard Hennemann, Director

Edwin Smith

Ronald McCoy

Jo Anne Mueller

Mildred Reigh

This program, leading to a Master of Education Degree in Mathematics for Elementary School Teachers, is designed to give the elementary school teacher both depth and breadth in the mathematical concepts essential to a contemporary school mathematics program. The sequence of the courses listed below will prepare the student to serve as a resource person for the elementary school mathematics program within his school or school district. These courses are not open to students enrolled in the M.Ed. or M.S. programs in mathematics.

To be eligible for admission to the program, applicants must possess a Provisional Pennsylvania College Elementary Teacher's Certificate or its equivalent as well as meet the other general requirements for admission to the Graduate School.

Upon admission to the program, each student will be assigned a course adviser by the Chairman of the Mathematics Department. Together they will plan a program which is best suited to the student's background and professional aspirations. Thus, a student who has completed a concentration in mathematics as an undergraduate would be expected to start his course work in the Subject Matter Concentration Area with second level courses (ElMath 504 or 506), while a student with less background would start with courses at the first level (ElMath 501 or possibly ElMath 503).

A research adviser will be assigned after consultations between the student, his course adviser, the Chairman of the Mathematics Department and the prospective research adviser result in the selection of a research topic by the student. The research adviser will then assist the student in preparing and presenting his thesis or research project.

CURRICULUM FOR THE MASTER OF EDUCATION IN MATHEMATICS FOR ELEMENTARY SCHOOL TEACHERS DEGREE PROGRAM

I. Subject Matter Concentration Areas: (at least 18 semester hours of work will be required from the following:)

A. Mathematics (at least 14 semester hours are required from this area)

ElMath	501	Basic Concepts in Mathematics I (Elementary Majors only)	2 s.h.
ElMath	502	Basic Concepts in Mathematics II (Elementary Majors only)	2 s.h.
ElMath	503	Foundations of Algebra I	2 s.h.
ElMath	504	Foundations of Algebra II	2 s.h.
ElMath	505	Principles of Geometry I	2 s.h.
ElMath	506	Principles of Geometry II	2 s.h.
ElMath	507	Coordinate Geometry and Trigonometry I	2 s.h.
ElMath	508	Coordinate Geometry and Trigonometry II	2 s.h.
ElMath	509	Introduction to Number Theory	2 s.h.
ElMath	510	Introduction to Logic and Boolean Algebra	2 s.h.
ElMath	511	Introduction to Computing Machines and Their Uses	2 s.h.
ElMath	512	Introduction to Probability and Statistics	2 s.h.
ElMath	513	Calculus I	2 s.h.
ElMath	514	Calculus II	2 s.h.
ElMath	515	Intuitive Topology	2 s.h.

Math	582	Theory of Probability	2 s.h.
Math	584	Mathematical Statistics I	2 s.h.
B. Related Studies: 4 semester hours of work in this area may be counted as part of the subject matter concentration with permission of the faculty adviser. These should include EISc 530 with additional courses selected from the other courses listed below.			
EISc	530	Quantitative Tools for Elementary Science	2 s.h.
EISc	540	Chemistry I	2 s.h.
EISc	541	Chemistry II	2 s.h.
EISc	550	Physics I	2 s.h.
EISc	551	Physics II	2 s.h.
II. Professional Studies (at least 8 semester hours including EIMath 520 and a Research Paper or Thesis)			
LRes	500	Seminar in Learning Resources	2 s.h.
Grad	516	Statistical Methods I	2 s.h.
Grad	517	Statistical Methods II	2 s.h.
Grad	550	Thesis	2-4 s.h.
El	531	Curriculum Problems in Elementary Education	2 s.h.
El	533	Reading Disabilities of Elementary School Children	2 s.h.
El	543	Resource Materials in Elementary Science	2 s.h.
El	548	Creativity and the Elementary School Child	2 s.h.
El	551	Recent Innovations in Elementary Education	2 s.h.
El	552	Evaluating the Elementary School	2 s.h.
El	553	Supervision and Improvement of Instruction in the Elementary School	2 s.h.
El	555	Advanced Human Development and Learning	2 s.h.
Psy	531	Psychology of the Exceptional Child	2 s.h.
Psy	532	Studies in Pupil Adjustment	2 s.h.
EIMath	520	Curriculum and Instruction in Elementary School Mathematics Programs	2 s.h.
III. Foundations of Education—two (2) semester hours of work to be selected from the following courses:			
Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.
IV. Research Techniques—one of the following courses is required. It should be scheduled early in the student's program.			
Grad	515	Elements of Research	2 s.h.
or			
Math	600	Methods of Research in Mathematics	2 s.h.

Course Descriptions

EIMath 501 Basic Concepts in Mathematics I 2 s.h. (Formerly Math 521)

This course is designed for students who as undergraduates have not taken Math 160 or an equivalent course.

Some of the topics included in this course are: Sets; relations and functions; cardinal number concept; system of whole numbers; rationale for traditional computational algorithms; numeration systems; primes; factorization; Fundamental Theorem of Arithmetic; tests for divisibility; non-metric geometry and mathematical systems.

EIMath 502 Basic Concepts in Mathematics II 2 s.h.

This course is a continuation of EIMath 501 and is designed for students who have not taken Math 520 or an equivalent course as undergraduates. Topics to be considered: The systems of integers, rational numbers and real numbers; rationale for traditional computational algorithms; absolute values; fractions and decimal notation, ratio; percent; proportion;

completeness; metric geometry; geometric constructions; introduction to plane coordinate geometry; informal probability and topology. Prerequisite: EIMath 501.

EIMath 503 Foundations of Algebra I 2 s.h.

This course will include topics touched upon in earlier courses, but from a more rigorous and abstract approach. Topics to be considered are: Algebraic structures, such as groups, rings and fields; the Real Number System as a complete ordered field; solution sets and their graphs for equations and inequalities; real functions and relations as a unifying concepts; and, if time permits, the Complex Number System as an extension of the Real Number System. The spiral development of algebraic concepts will be stressed throughout the course. Prerequisite: EIMath 502 or an equivalent undergraduate course.

EIMath 504 Foundations of Algebra II 2 s.h.

This course is intended to extend and enlarge upon the concepts developed in EIMath 503. Topics to be considered: Polynomial equations in the Real Number System and over other fields; an introduction to the history and theory of equations; the complex numbers as a field; more on algebraic structures; real functions and their graphs. The spiral development of algebraic concepts will be stressed throughout the course. Prerequisite: EIMath 503 or an equivalent undergraduate course.

EIMath 505 Principles of Geometry I 2 s.h.

This course includes a discussion of such topics as: congruences; measurement; parallelism; similarity; construction of proofs; practical applications; elements of spherical and solid geometry (introduction and intuitive approach) and constructions. The newer notation, vocabulary and approach when teaching these topics in elementary schools will also be discussed. Prerequisite: EIMath 502 or an equivalent undergraduate course.

EIMath 506 Principles of Geometry II 2 s.h.

This course will extend and enlarge upon concepts developed in EIMath 505. Topics to be considered: indirect proofs; more complicated constructions; centroids; translations and rotations in the plane; elements of solid geometry. Also, modern geometries such as topology, finite geometries, and other non-Euclidean geometries will be introduced. Prerequisite: EIMath 505 or an equivalent undergraduate course.

EIMath 507 Coordinate Geometry and Trigonometry I 2 s.h.

EIMath 507 and EIMath 508 are intended to give a foundation in fundamental topics from trigonometry and analytic geometry. Topics considered in EIMath 507: trigonometric functions and other periodic functions and their graphs; solution of trigonometric equations; inverse functions and their graphs; the Complex Number System as a vector space. Prerequisite: EIMath 503 or an equivalent undergraduate course.

EIMath 508 Coordinate Geometry and Trigonometry II 2 s.h.

EIMath 508 will extend the investigation of real relations and their graphs to include linear functions and their graphs, relations whose graphs are the conic sections, systems of equations and their graphs, polar coordinate systems, transformations of coordinate systems, and other related topics. Prerequisite: EIMath 507 or an equivalent undergraduate course.

EIMath 509 Introduction to Number Theory 2 s.h.

This course will pay special attention to representations of the real numbers in various numeration systems; factorization and the primes; congruences and modular arithmetic. Other topics to be investigated: linear diophantine equations; continued fractions and number theoretic functions. Prerequisite: EIMath 503.

EIMath 510 Introduction to Logic and Boolean Algebra 2 s.h.

This course is an introduction to some of the basic ideas, terminology and notation of logic and Boolean Algebra. Topics considered: symbolic

logic, with special emphasis on those portions of logic which depend heavily upon the algebra of propositions; other applications of Boolean Algebra such as the algebra of sets, the algebra of switching circuits; an introduction to quantification theory and its value in determining the validity of mathematical arguments. Prerequisite: ElMath 503.

**ElMath 511 Introduction to Computing Machines
and Their Uses** **2 s.h.**

This course is intended to introduce the student to computing machines and techniques which could have implications for the contemporary elementary school mathematics curriculum. Topics include: an understanding of the construction and uses of nomograms; slide rules; desk calculators and the high speed digital computer. A brief introduction to computer programming will also be a feature of the course. Prerequisite: ElMath 503.

ElMath 512 Introduction to Probability and Statistics **2 s.h.**

This course is designed to introduce students to the fundamental concepts of probability which will enable them to analyze data and make predictions from population samples. Methods and materials for teaching related topics in the elementary school and junior high school will be discussed.

ElMath 513 Calculus I **2 s.h.**

Topics will include: differential calculus of polynomials and rational functions; anti-derivatives and integrals of polynomials; techniques of differentiation and integration. Intuitive notions and applications will be stressed. Prerequisite: ElMath 508.

ElMath 514 Calculus II **2 s.h.**

Topics include differential and integral calculus of algebraic and transcendental functions with applications. Intuitive notions and applications will be stressed. Prerequisite: ElMath 513.

ElMath 515 Intuitive Topology **2 s.h.**

This course will introduce the student to selected topological concepts from the intuitive, rather than the axiomatic viewpoint. These concepts will be introduced, discussed and used informally on the basis of the student's experience. Topics considered: networks and maps; topological equivalence in three-dimensional space; The Jordan Curve Theorem; topological transformations and spaces. Prerequisite: ElMath 514.

**ElMath 520 Curriculum and Instruction in Elementary
School Mathematics Programs** **2 s.h.**

This course is designed to give the elementary school teacher experience with the literature, equipment and materials used in teaching mathematics with its new emphases in the elementary schools. Experimental programs in contemporary mathematics such as the Madison Project, SMSG, and the Minnemast Project will be examined and discussed. Criteria to be considered in the selection of suitable texts for elementary school mathematics programs and ways of implementing a contemporary mathematics program in a school district will be discussed. Investigation, discussion, demonstration, and evaluation of materials and programs will be a part of each person's activity. Prerequisite: Math 502 and consent of the instructor.

MUSIC AND MUSIC EDUCATION

Hugh B. Johnson, Chairman

Tibor Bachman	Gladys Dunkelberger	Gary J. Olnstead
William R. Becker	Olive M. Furnear	Jane Olnstead
Robert E. Bernat	Stephen Fry	Laurence J. Perkins
David T. Borst	Irving Godt	Daniel Perlongo
Wallis D. Braman	Walter O. Golz	Peter J. Popiel
Mary Lou Brecker	Arvilla T. Harrold	Nicolo Sartori
Robert W. Burggraf	H. Eugene Hulbert	Ann Staples
Catherine C. Carl	Dominic Intili	James Staples
Christina Cha	Robert Lloyd	Elizabeth D. Stewart
Charles A. Davis	C. David McMaughton	Richard E. Thorell
Ruth De Cesare	Delight Malitsky	Eva Vouklizas
Daniel Di Cicco	Russel C. Nelson	J. Herbert Wildeboor

The major purpose of the Graduate program in Music is to provide the student with opportunities to improve his skills as teacher, performer or scholar beyond the bachelor's degree. Upon acceptance by the Graduate School, each student may request or will be assigned by the Chairman of the Department of Music an adviser who will oversee his progress, help to plan his sequence of courses, and who will be responsible for the formation of his thesis or recital committee. For details, the student should consult the Student Handbook of the Department of Music.

Prerequisite: Undergraduate degree with major in music or its demonstrated equivalent.

Entrance Requirement: Placement examinations will be required in theory, music history, piano proficiency and principal performing medium. The adviser will use the results of these examinations to determine areas of deficiency and to prescribe specific electives.

CURRICULUM FOR MASTER OF ARTS IN MUSIC

Major Offerings: (a) Music History and Literature, (b) Music Theory and Composition, (c) Music Performance.

Credit Hours Required: 30 semester hours

I. Core courses prerequisite for further study and required of all candidates for M.A. degree:

Mus 500	Bibliography of Music	3 s.h.
Mus 516	Analytical Techniques	3 s.h.
Grad 515	Research Techniques	2 s.h.
		<u>8 s.h.</u>

II. Additional Requirements:

A. Music History and Literature Major		
Grad 550	Thesis	4 s.h.
B. Music Theory and Composition Major		
Grad 550	Thesis or Composition	4 s.h.
C. Music Performance Major		
Mus 540-612	Applied Music	12 s.h.
Grad 550	Recital	4 s.h.

III. Electives:

A. Music History and Literature Major	18 s.h.
(Twelve semester hours should be in major area)	
B. Music Theory and Composition Major	18 s.h.
(Twelve semester hours should be in major area)	
C. Music Performance Major	6 s.h.
(None may be taken in Applied Music)	

CURRICULUM FOR MASTER OF EDUCATION IN MUSIC EDUCATION

Students working for this degree will complete thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration Area:

A. Core Courses—prerequisite to further study:

Mus 500 Bibliography of Music	3 s.h.
Mus 516 Analytical Techniques of Music	3 s.h.

B. AMus 501-670 Applied Music

4 s.h.

C. Grad 550 Thesis or Recital

4 s.h.

D. Elective Courses

12 s.h.

To be chosen on the basis of placement examinations from current course offerings of the Music Department. Eight (8) semester hours should be in Music Education and four (4) may be taken in general studies.

II. Foundations of Education

2 s.h.

One of the following courses is to be chosen:

Ed 511 Historical Foundations of Education (2 s.h.)

Ed 512 Philosophical Foundations of Education (2 s.h.)

Ed 513 Social Foundations of Education (2 s.h.)

III. Research Techniques—the following course is required. It should be scheduled early in the student's program:

Grad 515 Elements of Research	2 s.h.
30 s.h.	

Course Descriptions

Mus 500 Bibliography of Music 3 s.h.

The aim of the course is to introduce graduate students to the various types of music, music literature and bibliographical tools which exist and which may be used in research in music. As a project, each student will prepare an extensive annotated bibliography of a musical subject within his special interest.

Mus 501 Advanced Choral Conducting 2 s.h.

Material will include large choral works with and without accompaniment. The student will be expected to develop skills in reading score.

Mus 502 Advanced Instrumental Conducting 2 s.h.

An intensive study of large instrumental works will be undertaken. The skill development of each individual will be stressed.

Mus 503 Music of the Baroque Era 3 s.h.

A survey of music from about 1600 to about 1750.

Mus 504 Music of the Classic Era 3 s.h.

A survey of music from about 1725 to about 1827.

Mus 505 Music of the Romantic Era 3 s.h.

A survey of music from about 1800 to about 1910.

Mus 507 Music of the 20th Century 3 s.h.

A survey of the principal stylistic trends in music from 1900 to the present.

Mus 508 Music of the 16th Century 3 s.h.

A survey of music from about 1500 to about 1600.

Mus 509 Biography 3 s.h.

A study of the life and works of a single composer in detail. The specific composer will be chosen by the instructor. The course may be repeated once for a total of two Biography courses of different composers.

Mus 510 Seminar in Music Literature 3 s.h.

The subject matter will change each semester at the pleasure of the instructor. Students will make presentations and write an extensive research paper. The seminar may be repeated for credit any number of times. Topics will be chosen so that an in-depth study can be made of narrowly defined areas, such as "Early Romantic Piano Music," "The Music Drama of Wagner," "Electronic Music," etc.

Mus 511 Composition 2 s.h.

Composition of Music in the various song forms through the rondos and the larger sonata allegro form. The student will be guided in his compositional attempts by careful analysis of similar forms of major composers. Instruction will be highly individualized and will depend considerably on the personal interest of the student.

Mus 512 Advanced Orchestration 2 s.h.

Consideration will be given to the problems of scoring for the full symphony orchestra, the string orchestra and the chamber orchestra. Students will be expected to produce a full score and orchestral parts so that the orchestration may be tested by actual playing by the University Symphony.

Mus 513 Advanced Band Scoring 2 s.h.

The problems of scoring for the modern concert band will be considered in detail. In addition, the problems of scoring for the brass band, the wood-wind choir, and the percussion ensemble will also be considered.

Mus 514 Advanced Choral Arranging 2 s.h.

Four-part writing for chorus will be reviewed. Five, six, seven, and eight-part writing will comprise the large part of the course. Special consideration will be given to the problem of writing for men's voices and for women's voices.

Mus 515 Canon, Double Counterpoint, and Fugue 2 s.h.

The application of contrapuntal techniques through analysis and creative writing. Included will be the study and writing of two- and three-voice canons; two- and three-part inventions; and two-, three-, and four-voice fugues.

Mus 516 Analytical Techniques 3 s.h.

A study of representative compositions of various periods, which emphasis on formal harmonic and stylistic analysis. The student will develop the basic analytical techniques necessary for the analysis of music of any period.

Mus 517 Acoustics of Music 2 s.h.

This course is designed for graduate students in Music. It will explore the nature and transmission of sound, the vibratory characteristics of musical instruments and the human voice, the ear and the psychology of hearing, the evolution of the Western tempered-scale, and the dimensions and materials of concert hall construction.

**Mus 521 Music Literature and Materials
(NON-MUSIC MAJORS ONLY)** 2 s.h.
(see Elementary Education Program)

The purpose of this course is to further enhance the musical background of the elementary teacher through acquaintance with suitable literature and materials.

**Mus 528 Contemporary International Approaches to
Elementary Music Education** 2 s.h.

An introduction to new developments in elementary music education practices based on the techniques originated by Carl Orff in Germany, Zoltan

Kodaly in Hungary and Shinichi Suzuki in Japan. Authentic adaptations of music and materials will be used in lecture, demonstration and workshop situations.

Mus 529 Advanced String Pedagogy 2 s.h.
Study of the specific techniques and problems of teaching violin, viola, cello, and double bass in both individual and class situations.

Mus 531 Administrative Problems in Music Education 2 s.h.
A review of the conventional administrative organization of music education in the public schools. The role of the music director, the music specialist, the consultant, and the music resource teacher will be carefully defined. Consideration will be given to the problems of scheduling in the public school. Current issues concerned with music education and public education in general will be considered, including curriculum development.

Mus 532 Seminar in Music Education 2 s.h.
There will be a considerable amount of freedom in the development of this course. The content each time it is offered will be governed by the specific needs of the students programming the course. These needs will be of two general classes: (1) strengthening areas of weakness, (2) exploring areas of interest.

Mus 533 Comparative Choral Methods 2 s.h.
Materials and procedures of the preparation of vocal groups for public performance. Several accepted, yet contrasting, approaches will be considered, ranging from the Christiansen technique to that of John Finley Williamson. Special attention will be given to program building.

Mus 534 Comparative Instrumental Methods 2 s.h.
Consideration will be given to those materials and procedures which have been proven by actual use in the United States. These various approaches will be compared and given a critical analysis by the class. Rehearsal techniques, efficient use of time and basic motivation will be stressed.

Mus 535 Psychology of Music Education 2 s.h.
An analysis of the latest evidence produced by the field of psychology in music education as applied in actual classroom situations. A review of the latest developments in psychological research relating to specific education problems will be included.

Mus 537 Techniques of the Marching Band 2 s.h.
The theory and practical application of the fundamentals of precision drill will be studied in detail. Also, this course deals with building "half-time shows," materials and instrumentation of the marching band.

Mus 538 Marching Percussion Workshop 1-2 s.h.

Mus 539 Vocal Workshop—The Bilingualistic Approach 2 s.h.
The emphasis of study is placed upon the physiological structure and nature of singing in terms of the complete correlation and coordination of anatomy and psychology with performance, analysis, and training. This will be a practical, functional course correlating the latest scientific knowledge to the immediate needs of workshop members and of those they teach.

Applied Music (ApplMus 501-670) 1-6 s.h.
The following courses will be taught in the form of private lessons geared to the individual student and aiming at maximum progress of each student, depending on the background of the student and the time available. The student should for any series of lessons use the first number in programming for the first time, the second number for the second time, etc.

ApplMus 501, 551, 601, 651 Private Piano (Golz, Harrold, Malitsky, Sartori, J. Staples, Vouklizas)

ApplMus 502, 552, 602, 652 Private Organ (Carl)

ApplMus 503, 553, 603, 653 Private Harpsichord (A. Staples)

- ApplMus 505, 555, 605, 655 Private Voice (Cha, Dunkelberger, Nelson, Stewart, Wildeboor)
- ApplMus 506, 556, 606, 656 Private Violin (Malitsky)
- ApplMus 507, 557, 607, 657 Private Viola (Perkins, Malitsky)
- ApplMus 508, 558, 608, 658 Private Cello (J. Olmstead)
- ApplMus 509, 559, 609, 659 Private Bass Viol (Braman)
- ApplMus 510, 560, 610, 660 Private Flute (Breckler)
- ApplMus 511, 561, 611, 661 Private Clarinet (DiCicco)
- ApplMus 512, 562, 612, 662 Private Oboe (Lloyd)
- ApplMus 513, 563, 613, 663 Private Bassoon (Borst)
- ApplMus 514, 564, 614, 664 Private Saxophone (Lloyd)
- ApplMus 515, 565, 615, 665 Private Trumpet (Becker)
- ApplMus 516, 566, 616, 666 Private French Horn (McNaughton)
- ApplMus 517, 567, 617, 667 Private Trombone (Thorell)
- ApplMus 518, 568, 618, 668 Private Baritone Horn (Popiel)
- ApplMus 519, 569, 619, 669 Private Tuba (Popiel)
- ApplMus 520, 570, 620, 670 Private Percussion (G. Olmstead)

PHILOSOPHY

Robert M. Hermann, Chairman

Graduate courses in Philosophy are primarily designed to provide elective study in an unfamiliar discipline for students teaching in the public schools. No graduate degree in Philosophy is offered. Degrees toward which credit in these courses may be used are indicated in the curriculum requirements sections of the catalog. Research or thesis work may be done in Philosophy with approval of the student's major program adviser.

Phil 580 Readings in Religious Thought 2 s.h.

An examination of basic problems in the philosophy of religion: defining "religion," arguments for the existence of God, conceptions of Deity, claims and sources of religious knowledge, the logic of religious language, humanistic naturalism as theology, religion and morality, the problem of evil.

Phil 581 Problems in Logic 2 s.h.

An analysis of problems in meaning, of the formal structure of arguments, and of empirical inquiry. Semantics, syntactics, and empirics. Fallacy. (Staff)

Phil 582 Problems of Ethics 2 s.h.

The rational justification of moral judgments. Analysis of the function and meaning of moral language. (Staff)

Phil 583 American Philosophic Thought 2 s.h.

A study of the more influential and original philosophies developed in America from the colonial period to the present. (Staff)

Phil 584 Philosophy Seminar 2 s.h.

Area research in the discipline, considering various facets of a central problem. Students doing a thesis or research project in Philosophy will register for this course. (Staff)

PHYSICS

Richard E. Berry, Chairman

Gary Buckwalter, Director of Graduate Studies

Jerry Eddy

John Fox

Norman Gaggini

Patrick McNamara

John Matolyak

George Matous

Marilyn Noz

Daniel Reiber

David Riban

Richard Roberts

Dennis Whitson

The graduate program in Physics offers a choice of two degrees. The degrees are a Master of Education with a major in Physics and a Master of Science with a major in Physics. The student obtaining a master's degree for fulfillment of certification requirements will usually select the Master of Education Degree. The student obtaining a master's degree for additional preparation for research or further graduate work will usually select the Master of Science Degree. Curriculum and requirement for these degrees are described in this bulletin.

With a wide range of possible courses and research areas available, the student is required to have the consent of his departmental adviser before selecting a course or initiating a research project. Adviser assignments are made as soon as the acceptance of a graduate student reaches the Physics Department. The graduate student should arrange appointments with his adviser by contacting the secretary in the Physics Office.

The theoretical Physics courses are prerequisites for about half of the more advanced courses and should be taken at the first opportunity. Theoretical Physics I may not be required of students who have an adequate background in applied differential equations. Math 357 is a satisfactory substitute for our recent graduates. This should be discussed with your Physics adviser before programming.

Curriculum for Master of Education Degree

To major in Physics, the student must have had at least General Physics, Atomic and Nuclear Physics, Electronics, Mechanics I and Optics or their approved equivalents as well as Mathematics through the equivalent of Analytic Geometry and Calculus II.

Students working for this degree will complete the thirty semester hours of work in accordance with the following divisions:

- I. Subject Matter Concentration—Sixteen to twenty-two (16-22) semester hours from the offerings under A and B.

A. Required Courses

Phys	502	Theoretical Physics I	2 s.h.
		Note: Not required of students who have credit for Math 357 or its equivalent.	
Phys	503	Theoretical Physics II	2 s.h.
Phys	512	Curriculum Developments in Secondary School Physics	2 s.h.
Phys	521	Advanced Laboratory Practice I	2 s.h.
		OR	
Phys	522	Advanced Laboratory Practice II	2 s.h.
Phys	542	Analytic Mechanics II	2 s.h.
Phys	551	Electricity and Magnetism I	2 s.h.
Phys	552	Electricity and Magnetism II	2 s.h.
		Note: Phys 551 and 552 will not be required of students who have taken Phys 322 and 323 after Sept. 1966.	
Phys	561	Quantum Mechanics I	2 s.h.
Phys	565	Introduction to Nuclear Physics	2 s.h.
Sci	576	Growth of Science and Its Concepts II	2 s.h.

B. Elective Courses

Phys	511	Secondary School Physics Laboratory Practices	2 s.h.
Phys	521	Advanced Laboratory Practice I	2 s.h.
Phys	522	Advanced Laboratory Practice II	2 s.h.
Phys	533	Thermodynamics	2 s.h.
Phys	535	Electronics	4 s.h.
Sci	575	Growth of Science and Its Concepts I	2 s.h.

Any Graduate courses offered by the Mathematics or Natural Science Departments.

II. Research Techniques

The following course is required. It should be scheduled very early in the student's program.

Grad	515	Elements of Research or	
Phys	600	Methods of Research in Physics	2 s.h.

III. Foundations of Education

One course must be selected from these offerings:

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Thesis or Research Project

A thesis or research project is required of each student. The thesis may earn from two to four hours credit.

Grad	550	Thesis	2-4 s.h.
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A research project fulfills this requirement, but does not earn any semester hour credit.

V. Free Electives

The student may complete the thirty semester hour requirement by choosing from among any of the offerings of the graduate school, with, of course, the advice and approval of his graduate adviser. The student must satisfy any stated prerequisites for the elective courses which he chooses.

Curriculum for the Master of Science Degree

- I. Admission Requirements. Any student meeting the requirements of the graduate school and having either a B.A. or a B.S. with the major in physics will be permitted to initiate study in this curriculum. Students having other degrees that provide sufficient preparation in mathematics and physics may be permitted to initiate study with approval of the Chairman of Physics. Each student is required to pass a preliminary examination based on undergraduate and first year graduate courses before he will be fully admitted to this degree program.

II. Subject Matter Concentration 18 s.h.

A primary objective of this curriculum is to bring every degree candidate to a definite level of proficiency in Physics. To demonstrate the required level of proficiency, the passing of the following 600 level courses is required:

Phys	641	Advanced Mechanics I	2 s.h.
Phys	642	Advanced Mechanics II	2 s.h.
Phys	651	Advanced Electromagnetic Theory I	2 s.h.
Phys	652	Advanced Electromagnetic Theory II	2 s.h.
Phys	661	Quantum Mechanics II	2 s.h.
Phys	662	Quantum Mechanics III	2 s.h.

Some of the recent senior level courses in universities provide sufficient background for a very able student to pass the above courses. Usually the adviser will suggest that the student take some of the 500 level courses in order to compensate for omissions in the student's preparation.

A program of courses must be arranged with an adviser and be approved by the Physics Department.

III. Mathematics Concentration 6 s.h.

In consultation with his adviser, the student may take any course in the graduate program of the mathematics department to fulfill this requirement. The courses selected must be approved by the adviser and the Physics Department.

IV. Research Requirement 6 s.h.

Each Master of Science student is required to undertake an individual research problem under the direction of one of the Graduate Faculty. The 6 semester hour requirement is fulfilled by scheduling the following courses:

Grad	515	Elements of Research or	
Phys	600	Methods of Research in Physics	2 s.h.
Grad	550	Research and Thesis	4 s.h.

V. Comprehensive Examination

Following the completion of the research requirement the student is required to pass a comprehensive examination on both research and required course requirements.

Course Descriptions

Phys 500 Special Studies 1-6 s.h.

A special topic may be offered at the discretion of the Department to fulfill a special necessity.

Phys 502 Theoretical Physics I 2 s.h.

This is a course in the application of mathematical methods to physical theory. Included will be a brief review of differential and integral calculus, series expansions, partial differentials and first-order linear differential equations.

Phys 503 Theoretical Physics II 2 s.h.

Applications in theoretical physics of vector calculus, partial differential equations, Fourier series and Green's and Stokes' theorems. Prerequisite: Phys 502 or its equivalent.

Phys 504 Theoretical Physics III 2 s.h.

This course is to serve as a preparation in mathematical physics for graduate students. Included will be vector and tensor analysis, matrices, infinite series, complex variables, and the calculus of residues. Prerequisite: Permission of Department.

Phys 505 Theoretical Physics IV 2 s.h.

As a continuation of Phys 504 this course will cover second-order differential equations, Sturm-Liouville Theory, gamma functions, Bessel functions, Legendre functions and other special functions, Fourier series, integral transforms, integral equations and the calculus of variations. Prerequisite: Phys 504.

Phys 511 Secondary School Physics Laboratory Practice 2 s.h.

This course is designed not only to give the student training in the use of PSSC and Harvard Project Physics Laboratory materials, but also to increase his ability to make the laboratory a more effective teaching tool.

Phys 512 Curriculum Developments in Secondary School Physics 2 s.h.

This course will include an intensive study of the curriculum developments in Secondary School Physics, such as PSSC and HPP. The philosophy, methodology and cognitive theory behind each curriculum will be considered. The laboratory equipment, experiments, and visual aids for each will be studied in their proper setting.

- Phys 521 Advanced Laboratory Practice I** 2 s.h.
Measurements of radioactivity using G-M, gas-flow, scintillation and solid state detectors. Determination of half-lives, beta-ray energies by absorption studies and gamma-ray energies by single and multi-channel pulse-height analysis.
- Phys 522 Advanced Laboratory Practice II** 2 s.h.
The selection of experiments will depend upon the student's previous training and interest. Emphasis will be placed upon interpretation of data. Interferometry, spectrometry, microwave optics, NMR and mechanical vibrating systems are some of the areas in which work may be done.
- Phys 531 Atomic Structure** 2 s.h.
This course includes a brief review of fundamentals of electricity and magnetism. Following this, the major topics are charged particles, electron configurations, atomic spectra, atomic structure, waves and particles.
- Phys 533 Heat and Thermodynamics** 2 s.h.
Topics treated in this course include temperature, laws of thermodynamics, the Carnot cycle, entropy, properties of ideal gases and pure substances, low temperature physics and application of thermodynamic principles.
- Phys 535 Electronics** 4 s.h.
Kirchoff's laws are reviewed and applied to AC circuits. Tube and transistor amplifiers, oscillators, negative feed-back amplifiers and various power supplies are constructed in the lab. Dual-trace oscilloscopes and other advanced laboratory instruments are used to explore the properties of circuit elements and amplifiers.
- Phys 541 Analytical Mechanics I** 2 s.h.
Kinematics, particle dynamics, gravitation, free and forced harmonic motion. The treatment of these topics utilizes the vector calculus and the differential and integral calculus.
- Phys 542 Analytical Mechanics II** 2 s.h.
Dynamics of rigid bodies, waves and vibrations, applications of Fourier Series and LaGrange's Equations.
- Phys 551 Electricity and Magnetism I** 2 s.h.
Coulomb's Law, electrostatic potential, Gauss' Law, dielectrics will be presented using vector calculus in a modern field formalism. Prerequisite: Phys 503.
- Phys 552 Electricity and Magnetism II** 2 s.h.
Biot and Savart's Law, induced emf, vector potential, displacement current, special relativity and electromagnetic radiation will be presented using techniques introduced in Phys 551. Prerequisite: Phys 551.
- Phys 561 Quantum Mechanics I** 2 s.h.
An introduction to the basic theory of wave mechanics. Prerequisite: Phys 503.
- Phys 565 Introduction to Nuclear Physics** 2 s.h.
Radioactivity, nuclear structure, nuclear reactions and elementary particles. Prerequisites: Phys 503 and 531 or its equivalent.
- Phys 600 Methods of Research in Physics** 2 s.h.
This course offers the student practical training in the special methods and materials of research in Physics. Emphasis is placed on types of research, use of Physics and Physics-related journals and library facilities. Prerequisite: Permission of Department.
- Phys 634 Statistical Mechanics** 2 s.h.
Classical statistics and an introduction to Quantum statistics through both proper combinatorial procedures and theory of ensembles. Prerequisite: Phys 533 or equivalent.

- Phys 641 Advanced Mechanics I** 2 s.h.
This course includes the following topics: LaGrange's Equations, Hamilton's Principle, Two body central force, Orthogonal Transformations, Euler Angles, Cayley-Klein parameters, Euler's Theorem. Prerequisite: Phys 312 or equivalent.
- Phys 642 Advanced Mechanics II** 2 s.h.
Rigid body mechanics, including Angular Momentum, Euler's equations, Precessions, Special relativity, Covariant four dimensional formulation, Covariant Lagrangian formulation, Legendre transformation and Hamilton's Equations, Least Action Principle, Canonical Transformations, LaGrange and Poisson Brackets, Constants of Motion and Symmetry. Prerequisite: Phys 641 or equivalent.
- Phys 651 Advanced Electromagnetic Theory I** 2 s.h.
Electrostatics employing mathematical tools of advanced calculus. The boundary value problem, Green's functions, multipole expansions, and applications of various series approximations.
- Phys 652 Advanced Electromagnetic Theory II** 2 s.h.
Magnetostatics, Time dependent Electromagnetic fields. Radiation and the electromagnetic theory of optics, plasma physics.
- Phys 657 Solid State Theory I** 2 s.h.
Introductions to Crystalline structures. Thermal, Electric and magnetic properties of solids. Prerequisite: Phys 561.
- Phys 661 Quantum Mechanics II** 2 s.h.
Wave mechanics including WKB approximation, representation, central forces, the Hydrogen Atom, Spin. Prerequisite: Phys 561 or Permission of Department.
- Phys 662 Quantum Mechanics III** 2 s.h.
Linear Vector Spaces, Dirac Notation, Perturbation Theory, Born Approximation, Bound State and Time-Dependent Perturbations in Introduction to Scattering. Prerequisite: Phys 661.
- Phys 690 Research Problems in Physics** 2-6 s.h.
Introduction to advanced research problems through individual assignment. Prerequisite: Permission of Department.

PSYCHOLOGY DEPARTMENT

Richard D. Magee, Chairman

Bruce D. Cartwright	John W. Reid
Kenneth F. Edgar	Robert H. Rittle
David E. Grover	Douglas A. Ross
D. Robert Jacobs	Carl W. Schneider
James K. Klinedinst	Lloyd K. Stires
Stanley W. Lore	Gordon F. Thornton
Gary W. Patton	George B. Walz

Affiliate Members:

Herbert I. Levit	Noel A. Plummer
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The Psychology Department offers a Master of Arts degree with concentrations in General Experimental Psychology and Clinical Psychology. The areas of concentration are so designed that graduates will be prepared to either immediately assume responsibilities in appropriate professional settings or proceed to doctoral level study. Students interested specifically in community college teaching should enroll in the Master of Arts in Social Science program with a major in psychology and a minor in another social science discipline. The department also offers courses open to students following other degree programs in the graduate school.

Master of Arts in Psychology

Admission Requirements

In addition to meeting the requirements for admission to the Graduate School, a student intending to work toward a Master of Arts in Psychology must have completed an undergraduate major in psychology, including courses in Experimental Psychology and Statistics, and earned a B average or higher in courses taken in psychology.

After completion of at least six hours of graduate work in psychology at Indiana, a student may formally apply to the Psychology Department's Graduate Admissions Committee for admission to degree candidacy. At this time, the applicant must present satisfactory scores on the Graduate Record Examination (both Aptitude and Advanced Tests) and recommendations from faculty members familiar with his work. He should also submit for approval a complete course program planned in consultation with his adviser.

Areas of Concentration

I. M. A. in Psychology with Concentration in General Experimental Psychology			
Psy	501	Research Methods in Psychology I: Advanced Research Design and Analysis	3 s.h.
Psy	502	Research Methods in Psychology II: Theory and Techniques of Psychological Measurement	3 s.h.
Psy	510	Community College Teaching Internship	2 s.h.
		°Electives in Psychology	10-18 s.h.
		°Electives in Related Fields	0-6 s.h.
Psy	570	Seminar in Psychology	2 s.h.
Grad	550	Thesis	2-4 s.h.

°Courses will be selected in consultation with the adviser to insure a background in the major areas of General Experimental Psychology.

II. M. A. in Psychology with Concentration in Clinical Psychology

Psy	501	Research Methods in Psychology I: Advanced Research Design and Analysis	3 s.h.
Psy	502	Research Methods in Psychology II: Theory and Techniques of Psychological Measurement	3 s.h.

Psy	525	Theory and Techniques of Psychological Intervention	3 s.h.
Psy	561	Advanced Psychological Practicum	9 s.h.
		*Electives in Psychology	2-8 s.h.
		*Electives in Related Fields	0-4 s.h.
Psy	570	Seminar in Psychology	2 s.h.
Grad	550	Thesis	2-4 s.h.

*Courses will be selected in consultation with the adviser so that the student fashions a program appropriate for his strengths and weaknesses, and relevant to his occupational choice.

M. A. in Social Science

(See Social Science for more complete description)

I. Major in Psychology

**Psy	501	Research Methods in Psychology I: Advanced Research Design and Analysis	3 s.h.
**Psy	502	Research Methods in Psychology II: Theory and Techniques in Psychological Measurement	3 s.h.
Psy	510	Community College Teaching Internship	2 s.h.
		Community College Teaching Internship (Minor Field)	2 s.h.
		*Electives in Psychology	9-11 s.h.
		*Electives in Minor Field	8-10 s.h.
Psy	570	Seminar in Psychology	2 s.h.
Grad	550	Project or Thesis	0-2 s.h.

II. Minor in Psychology

Psy	510	Community College Teaching Internship	2 s.h.
		*Electives in Psychology	8-10 s.h.

*Courses will be selected in consultation with the adviser so that the student fashions a program appropriate for his strengths and weaknesses and relevant to his occupational choice.

**Grad 515 Elements of Research or SS 514 Research Methodologies in Social Science may be substituted with approval of the Department Chairman.

Course Descriptions

Psy 501 Research Methods in Psychology I: Advanced Research in Design and Analysis 3 s.h.

Naturalistic observation, systematic observation and formal experimentation are studied in conjunction with appropriate techniques of statistical analysis; lab included. Prerequisites: Introductory courses in statistics and experimental psychology; Psychology major or minor. (Patton, Rittle)

Psy 502 Research Methods in Psychology II: Theory and Techniques of Psychological Measurement 3 s.h.

Correlational techniques, survey and interview methods, and psychological test construction and application will be studied. Prerequisites: Introductory courses in statistics and experimental psychology; Psychology major or minor. (Patton, Rittle)

Psy 510 Community College Teaching Internship 2 s.h.

This course is designed to prepare community college instructors through an emphasis on the objectives, materials, techniques, and evaluation of general education programs in Psychology. Prerequisites: Psychology major or minor. (Ross)

Psy 511 Conditioning and Learning 3 s.h.

The focus of this course is on animal research with discussion of classical conditioning, discrimination learning and aversive control of

behavior. Laboratory projects are conducted. Prerequisites: Course in experimental psychology; Psychology major or minor. (Walz)

Psy 512 Human Learning and Memory 3 s.h.

The methodology employed in the areas of verbal learning and retention, encoding, storage, and retrieval processes are discussed. Laboratory projects are conducted. Prerequisites: Course in experimental psychology; Psychology major or minor. (Grover)

Psy 513 History of Psychology 3 s.h.

This course is a comprehensive overview of the historical antecedents of contemporary psychology. Prerequisite: Psychology major or minor. (Grover)

Psy 514 Motivation 3 s.h.

This course provides a systematic study of how behavior is initiated, sustained, directed, and terminated. Laboratory projects are conducted. Prerequisites: Course in experimental psychology; Psychology major or minor. (Schneider)

Psy 515 Perception 3 s.h.

The interaction of sensory and cognitive events in the production of awareness of the world is evaluated. Laboratory projects are conducted. Prerequisites: Course in experimental psychology; Psychology major or minor. (Ross)

Psy 516 Physiological Psychology 3 s.h.

The relationship between behavior and the anatomy and physiology of the nervous system is studied. Laboratory projects are conducted. Prerequisites: Course in experimental psychology; Psychology major or minor. (Patton)

Psy 517 Social Psychology 3 s.h.

This course presents a scientific approach to the study of the behavior and experience of individuals in relation to other individuals, groups and culture. Prerequisite: Psychology major or minor. (Jacobs)

Psy 525 Theory and Techniques of Psychological Intervention 3 s.h.

This course provides an introduction to the major approaches to therapeutic psychological intervention; psychoanalysis, client-centered psychotherapy, group techniques and behavior modification are considered. Prerequisite: Departmental consent. (Edgar, Klinedinst)

Psy 530 Psychology of Growth and Development 2 s.h.

A comprehensive study of human growth and development from conception to death. Research findings in physiological, cognitive, emotional and social factors will be studied and applications made to the total development of one individual. Major developmental theories will be considered. (Lore)

Psy 531 Psychology of the Exceptional Child 2 s.h.

See Special Education

Psy 533 The Psychology of Personality 2 s.h.

This course provides an overview and integration of the major theories of personality. (Cartwright, Jacobs, Klinedinst)

Psy 534 Abnormal Psychology 2 s.h.

Theories of pathological behavior with reference to clinical and experimental data are studied. (Edgar, Klinedinst)

Psy 536 Psychology of Learning 2 s.h.

Learning theories are explored in terms of their breadth, historical development, and impact upon educational philosophy and practices. (Grover, Walz)

Psy 538 Psychology of the Gifted Child 2 s.h.

See Special Education

- Psy 539 Psychology of the Mentally Retarded Child** 2 s.h.
See Special Education
- Psy 540 Community Psychology and Mental Health** 2 s.h.
Contemporary models of mental health and illness which stress the relationship between individuals and the social systems with which they interact are examined. (Magee)
- Psy 541 Assessment of Intelligence** 2 s.h.
The student is introduced to various tests of general ability and is given training in their administration, scoring and interpretation. Prerequisites: Course in Introduction to Psychological Measurement or its equivalent; departmental consent. (Klinedinst, Lore)
- Psy 542 Assessment of Personality** 2 s.h.
The student is introduced to various tests of interest and personality, and is given training in their administration, scoring, and interpretation. Prerequisites: Course in Introduction to Psychological Measurement or its equivalent; departmental consent. (Edgar, Klinedinst)
- Psy 544 Advanced Learning Theories** 2 s.h.
A review of current research and theoretical developments in the psychology of learning. (Staff)
- Psy 561 Advanced Psychological Practicum** 3-9 s.h.
Provides graduate students qualified in either psychology or guidance with working experience in a clinical situation. Prerequisites: Permission of Director of Psychological Clinic or Coordinator of Practicum. (Staff)
- Psy 570 Seminar in Psychology** 3 s.h.
Papers based on reading in specific problem areas in the field of psychology are presented. Students carrying out thesis research in psychology will register for this course. Prerequisites: Psychology major or minor; admission to degree candidacy. (Staff)
- Psy 571 Independent Study in Psychology** 2-6 s.h.
Individual students develop and conduct research studies in consultation with a faculty member. Prerequisites: Psychology major or minor; departmental consent. (Staff)

SCIENCE

Charles R. Fuget, Director

Division of Natural Science and Mathematics

This degree is designed for teachers who are teaching General Science, for those who teach more than one science subject, and for those who have a deficiency in one or another of the fields of science. It may be to their advantage to be able to select courses from a variety of fields. The Master of Education degree with a major in Science should enable such teachers to upgrade their teaching by selecting suitable courses from the electives in the various fields listed under the Biology, Chemistry, Geoscience, and Physics headings. Students should study the prerequisites carefully to make sure they have the background for the courses they wish to take.

SCIENCE

Curriculum for Master of Education Degree

In order for a student to major in Science, he must have completed one year of undergraduate work in Biology, Chemistry, and Physics.

Students working for this degree with a major in Science will complete the thirty (30) semester hours of work in accordance with the following divisions:

- I. Subject Matter Concentration Area—fourteen to twenty-two (14-22) semester hours of work in subject matter content is to be selected from the various courses in the major areas of Biology, Chemistry and Physics with the approval of the candidate's adviser.
- II. Professional Studies—four to ten (4-10) semester hours of work, including Research Paper or the Thesis, to be selected from the following:

Grad	516	Statistical Methods I	.....	2 s.h.
LRes	500	Seminar in Learning Resources	.....	2 s.h.
Grad	550	Thesis	.....	2-4 s.h.
Psy	531	Psychology of the Exceptional Child	.....	2 s.h.
Psy	532	Studies in Pupil Adjustment	.....	2 s.h.
- III. Foundations of Education—two (2) semester hours of work to be selected from the following courses:

Ed	511	Historical Foundations of Education	.....	2 s.h.
Ed	512	Philosophical Foundations of Education	.....	2 s.h.
Ed	513	Social Foundations of Education	.....	2 s.h.
- IV. Research Techniques—the following course is required. It should be scheduled early in the student's program:

Grad	515	Elements of Research	2 s.h.
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In certain courses in the science department, additional laboratory time may be required beyond the regularly scheduled periods. Students who select a four-credit sequence are required to complete the sequence.

Sci 572 Experimental Techniques in Chemistry and Physics 2 s.h.

Emphasis will be placed on scholarly experience in experimentation, observation, and application of scientific concepts. Classroom and lecture demonstrations will be prepared, presented, and evaluated by students and instructor. Special attention will be given to the development of new ideas and new ways of presenting scientific principles. Prerequisites: Chemistry I, II, Physics I, II. (Bordas)

Sci 573-574 Computations in Physics and Chemistry 4 s.h.

This course is designed to help the teacher of physics and chemistry, who has a limited background in mathematics, to become more skillful in the solution of problems usually encountered in physics and chemistry courses.

It should also provide him with a more adequate background to deal with the problems in his courses in the graduate program. (Mathematics Staff)

Sci 575 The Growth of Science and Its Concepts I **2 s.h.**

Traces the development of the science concepts like time, matter and motion in Astronomy, Biology, Chemistry, Geology and Physics and their interaction with the growing society of Western Civilization from the earliest beginnings to the time of Newton. The treatment of these concepts will be essentially non-mathematical.

Sci 576 The Growth of Science and Its Concepts II **2 s.h.**

The influence and development of the concepts like time, matter and motion on Science and Western Civilization are studied from Newton to the present time with emphasis on the ideas of Relativity and Quantum Theory. Stress will be placed on the non-mathematical understanding of the basic ideas. Science 576 may be taken without having had Science 575, if the student secures the permission of the instructor.

Bio 568 Biology Practicum **2 s.h.**

This course is designed to convey to the high school biology teacher the knowledge of the preparation of culture media and solutions. Problems and techniques unique to the biological sciences with respect to demonstration material, handling and housing of plants and animals, safety in the laboratory and in the field, and the maintenance of equipment will be discussed. Theoretical and practical work will be done with the development of on-going experiments and research projects. Handbooks and other resource materials useful in the "laboratory approach" to biology will be given special attention.

SCIENCE FOR THE ELEMENTARY SCHOOL TEACHER

Francis W. Liegey, Chairman
Robert N. Moore, Director

Thomas E. Conway	Frederick R. Park
Joseph J. Costa	Paul Prince
Gary M. Ferrence	David M. Riban
Walter H. Granata, Jr.	Fred Schrock
William I. Heard	Martin L. Stapleton
Leon J. Hue	Richard F. Waechter
Jack Kuhns	Richard E. Wolfe
Robert N. Moore	Robert L. Woodard

The program leading to a Master of Education Degree in Elementary Science is designed to give elementary teachers depth and competency in the content areas of the physical and biological sciences. The assemblage of courses cited below should prepare the student for work as an Elementary Science resource person within his school or school district. Except for Bio 524 all of these courses are not open to majors in Biology, Chemistry, or Physics.

Following admission to the graduate school, each candidate is expected to appear before the Elementary Science Committee. At this meeting the candidate will be assigned to an advisor who will assist the student in planning the program of study deemed most appropriate for his professional growth. This advisor may also assist the student in selecting, preparing, and presenting his thesis or research project.

Curriculum for Master of Education Degree

This program is not intended for certification in science at the secondary level. It is designed to provide the elementary teacher with an opportunity to increase his ability to teach science at the elementary level. Students working for this degree with a major in Elementary Science will complete the thirty (30) semester hours of work in accordance with the following divisions:

- I. Subject Matter Concentration Area—fourteen to twenty-two (14-22) semester hours of work in subject matter content are to be selected from the following courses, except that a more advanced course may be required by the adviser if the background of the student warrants. It should be noted that in some courses in Elementary Science additional laboratory time may be required beyond the regularly scheduled periods.

EISc	510	Education in the Out-of-doors	2 s.h.
EISc	511	Education in the Out-of-doors	2 s.h.
EISc	530	Quantitative Tools for Elementary Science	2 s.h.
EISc	540	Chemistry I	2 s.h.
EISc	541	Chemistry II	2 s.h.
EISc	550	Physics I	2 s.h.
EISc	551	Physics II	2 s.h.
EISc	560	Botany I	2 s.h.
EISc	561	Botany II	2 s.h.
EISc	564	Zoology I	2 s.h.
EISc	565	Zoology II	2 s.h.
EISc	566	Conservation	2 s.h.
EISc	568	Field Biology I	2 s.h.
EISc	569	Field Biology II	2 s.h.
EISc	570	Geology	2 s.h.
EISc	574	Meteorology	2 s.h.
EISc	580	Astronomy	2 s.h.
Math	521	Basic Concepts in Mathematics	2 s.h.

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|------|-----|---|----------|
| ElSc | 588 | Field Natural History of Western Pa. | 2 s.h. |
| Bio | 500 | Special Studies | 2-6 s.h. |
- II. Professional Studies—four to ten (4-10) semester hours of work including research paper or the thesis to be selected from the following:
- | | | | |
|------|-----|---|----------|
| Grad | 516 | Statistical Methods I | 2 s.h. |
| LRes | 500 | Seminar in Learning Resources | 2 s.h. |
| Grad | 550 | Thesis | 2-4 s.h. |
| El | 531 | Curriculum Problems in Elementary Education | 2 s.h. |
| El | 533 | Reading Disabilities of Elementary School Children | 2 s.h. |
| El | 542 | Arithmetic in Elementary School | 2 s.h. |
| El | 543 | Resource Materials in Elementary Science | 2 s.h. |
| El | 544 | Recent Trends in Elementary Language Arts | 2 s.h. |
| El | 551 | Recent Innovations in Elementary Education | 2 s.h. |
| El | 553 | Supervision and Improvement of Instruction in the Elementary School | 2 s.h. |
| El | 555 | Advanced Human Development and Learning | 2 s.h. |
| Psy | 531 | Psychology of the Exceptional Child | 2 s.h. |
| Psy | 532 | Studies in Pupil Adjustment | 2 s.h. |
| ElSc | 592 | Elementary Science Curriculum | 2 s.h. |
- III. Foundations of Education—two (2) semester hours of work to be selected from the following courses:
- | | | | |
|----|-----|--|--------|
| Ed | 511 | Historical Foundations in Education | 2 s.h. |
| Ed | 512 | Philosophical Foundations in Education | 2 s.h. |
| Ed | 513 | Social Foundations of Education | 2 s.h. |
- IV. Research Techniques—the following course is required. It should be scheduled early in the student's program:
- | | | | |
|------|-----|----------------------------|--------|
| Grad | 515 | Elements of Research | 2 s.h. |
|------|-----|----------------------------|--------|

Course Descriptions

ElSc 510-511 Education in the Out-of-doors 4 s.h.

A course specifically designed to teach the elementary teacher to coordinate all of the elementary subjects into lessons taught in the out-of-doors that cannot ordinarily be taught in the classroom. Four (4) hours of laboratory. (Summers only) (Hue, Kuhns)

ElSc 530 Quantitative Tools for Elementary Science 2 s.h.

The course is designed to help the elementary teacher become acquainted with and gain proficiency in the quantitative aspects of science. The emphasis will be on practical problem solving related to typical laboratory data. Considerable time will be spent on instruments, instrument calibration, graphing, and graph interpretation (interpolation and extrapolation). The area under the curve idea and the meaning of slope on a graph will be explored extensively. Concentrated instruction in the use of the slide rule, use of logarithms and algebra, trigonometric functions, scientific notation and significant figures will be used as tools to achieve the above objectives. (Wolfe)

ElSc 540-541 Chemistry I, II 4 s.h.

These courses are designed to help the elementary teacher become acquainted with chemistry as it is today. They approach the study of chemistry through investigation. Unifying principles of chemistry will be developed placing emphasis on experimentation. No previous college chemistry is necessary as a prerequisite. They are laboratory-centered courses. It is planned that experiences be provided to furnish data for a background in which principles and topics are discussed. The methodology employed provides experiences that elementary teachers will find helpful in teaching science in the grades. Three (3) hours of lecture and/or laboratory per week for each course. It is necessary to complete Chemistry I before scheduling Chemistry II. (Heard, Costa)

ElSc 550-551 Physics I, II 4 s.h.

These courses are designed to increase the elementary teacher's knowledge and understanding of the concepts, methods, and experimental techniques of physics as a background for the teaching of that part of science in the elementary school. It is not the purpose of these courses to list what physics should be taught in the elementary grades nor how to teach it. The period will be devoted to lecture, class discussion and/or laboratory work. Physics I should be completed before Physics II is undertaken. (Riban)

ElSc 560 Botany in Elementary Science Education I 2 s.h.

A laboratory course involving a study of flowering plants. Plant structure and processes will be studied. Utilizing plants of the immediate environment, consideration will be given to the economic importance of plant and plant ecology. (Schrock)

ElSc 561 Botany in Elementary Science Education II 2 s.h.

This laboratory course is devoted to a study of non-flowering plants. The life histories of a limited number of representative plants will be studied and the physiology, ecology and economic importance of the various lower plant groups will be considered. (Schrock)

ElSc 564 Zoology in Elementary Science Education I 2 s.h.

A laboratory and field study course that begins with a survey of zoological taxonomy and proceeds with the study of representative invertebrate taxa. Emphasis is placed upon forms which may be observed or collected in the field during fall and early winter. (Stapleton)

ElSc 565 Zoology in Elementary Science Education II 2 s.h.

A laboratory and field course which stresses the natural history of vertebrate forms and their ecological relationships. General embryological and genetic principles are considered. Homologous structures are compared and their functions studied. Principles of animal behavior are introduced. (Stapleton)

ElSc 566 Conservation 2 s.h.

A new concept in conservation—corrective and preventive conservation for man's survival. The problems of pollution and population are the central theme. Field work is required. (Staff)

ElSc 568-569 Field Biology I, II 4 s.h.

A laboratory course that will acquaint the elementary teacher with the biological environment outside of the classroom and will also provide a number of activities that are applicable to the elementary school. Four (4) hours of laboratory. (summers only) (Waechter)

ElSc 570 Geology 2 s.h.

This course is designed specifically for those students enrolled in the elementary science program. One semester of descriptive geology is assumed as a geology background. Other students should acquire the consent of the instructor. The course includes a study of rocks and geology formations as they are related to elementary science. Past history of the earth, as well as present day geologic phenomena are discussed. Field trips and laboratory work are part of the course. Two (2) hours of lecture and/or laboratory. (Park)

ElSc 574 Meteorology 2 s.h.

The fundamentals of weather and weather instruments are discussed. Familiarization with weather instruments, maps, and records, as well as activities applicable to elementary science are underscored throughout the course. Two (2) hours of lecture and /or laboratory. (Prince)

ElSc 580 Astronomy 2 s.h.

A descriptive and qualitative study of stellar and solar system Astronomy. The topics include telescopes and space travel at a level adaptable to the elementary school classroom and involve techniques for their presentation. Two (2) hours lecture and/or laboratory. (Woodard)

ElSc 588 Field Natural History of Western Pennsylvania 2 s.h.

Bus and automobile travel throughout Western Pennsylvania will constitute the entire course. Places of interest in ecology, geology, conservation, and nature study will be visited. Offered in pre- or post-session only. Travel may require that the student be away from the campus for several days at a time. A travel assessment based upon needs will be made. (Ferrence)

ElSc 592 Elementary Science Curriculum 2 s.h.

This course naturally follows El 543 and is concerned with the various approaches to the teaching of science and the elementary bases for these approaches. The study of new curricula that are being used in the elementary schools and their psychological relationships are covered. Two (2) hours of class. (Ferrence)

SOCIAL SCIENCE

Raymond L. Lee, Director

Mamie Anderzhon	Marvin Huff	James Payne
Donald Ballas	John K. Kadlubowski	Edward E. Platt
Patrick A. Carone	David S. Keene	Downey Raibourn
Charles D. Cashdollar	Rudolph Kraus	Willis Richard
Edward Chaszar	Gopal Kulkarni	J. Merle Rife
Steven Cord	John J. Lank	John R. Sahli
John Cross	Dale Landon	Walter Shea
Wayne Davis	Neil Lehman	Bert A. Smith
Ronald T. Ferguson	Isadore Lenglet	Wayne Smith
Daniel I. Fine	Myron Levenson	Dorothy C. Vogel
Ernest Fricke	Irwin Marcus	Albert J. Wahl
Alexander Garvin	Joseph Mastro	Donald A. Walker
Thomas Gault	Jane S. Mervine	Patricia Walker
Clyde C. Gelbach	Vincent Miller	Stephen B. Ware
Virginia Gerald	Edgar Moore	William Warren
Thomas Goodrich	Robert L. Morris	Charles Weber
Brooke Grant	Esko E. Newhill	David Winslow
Ronald C. Green	Anja Olin-Fahle	Maurice Zacur
Richard F. Heiges	James Oliver	
Harry Holt	Dorothy A. Palmer	

The Master of Education Degree with a major in Social Science is designed to give secondary teachers greater depth and competency in the subject matter and research techniques of the social sciences.

Each student admitted to the Graduate School will be assigned to an adviser in the Social Science Division. All courses must be approved by that adviser.

Students working for this degree will complete a minimum of thirty (30) semester hours of work in accordance with the following divisions:

I. Subject Matter Concentration (14-22 s.h.)

Courses must be elected in three of five Social Sciences (Economics, Geography, History, Political Science, Sociology-Anthropology) to a minimum of 12 s.h. Four semester hours may be elected in allied fields (English, Mathematics, Foreign Language).

Economics

Econ 501	Foundations of Modern Economics	2 s.h.
Econ 525	Money, Banking, and Monetary Policy	2 s.h.*
Econ 551	International Economics	2 s.h.
Econ 552	Comparative Economic Systems	2 s.h.
Econ 553	Contemporary Economic Issues	2 s.h.
Econ 554	Economics Seminar (Prerequisite)	2 s.h.
Econ 555	Industrial Relations	3 s.h.
Econ 556	History of Economic Thought	3 s.h.

Geography

See pp. 120-124 for course descriptions.

History

See pp. 131-132 for course descriptions.

Political Science

PolS 560-565	Political Systems:	
560	Latin America	2 s.h.*
561	Africa	2 s.h.*
562	Asia	2 s.h.*
563	Middle East	2 s.h.*
564	Central and Eastern Europe	2 s.h.*
565	Atlantic Community	2 s.h.*

PolS	571	Foreign Policy Studies	2 s.h.
PolS	572	Comparative Political Studies	2 s.h.
PolS	573	Regional Political Studies	2 s.h.
PolS	574	Political Science Seminar (Prerequisite)	2 s.h.
PolS	575	American Political Parties	2 s.h.°
PolS	576	Legislative Process	2 s.h.°
PolS	577	Metropolitan Problems	2 s.h.°
PolS	578	American Constitutional Law	2 s.h.°
PolS	579	Modern Political Thought	2 s.h.°
PolS	580	Public Opinion	2 s.h.°
PolS	581	The Presidency	2 s.h.°
PolS	583	Federal Administrative Policy	2 s.h.°
PolS	584	Judicial Process	2 s.h.°
PolS	585	Political Philosophy	2 s.h.°
PolS	590	Studies in Political Science	2 s.h.°
PolS	591	Studies in Political Science	2 s.h.°
PolS	599	Political Science Internship	1-6 s.h.

° May occasionally be offered for 3 s.h. credit.

Sociology-Anthropology

Soc	562	Deviant Behavior	2 s.h.
Soc	563	Intergroup Relations	2 s.h.
Soc	564	Sociology Seminar (Prerequisite)	2 s.h.
Soc	565	Adolescent in American Society	2 s.h.
Anth	591	Studies in Anthropology	2 s.h.
Anth	592	Comparative Cultures	2 s.h.
Anth	593	The Science of Culture	2 s.h.
Anth	594	Anthropology Seminar (Prerequisite)	2 s.h.
Anth	595	Pre-History	2 s.h.

Unclassified

SS	510	New Approaches in Social Science Instruction	2 s.h.
SS	514	Research Methodologies in the Social Science	2 s.h.
SS	521	Contemporary American Issues	2 s.h.
SS	561	Social Policy Studies	2 s.h.
SS	598-599	Contemporary Europe	2-6 s.h.

II. Professional Studies (6-12 s.h.)

EdPsy	578	Advanced Studies in Learning Problems	2 s.h.
EdPsy	506	Advanced Educational Psychology	2 s.h.
EdPsych	573	Advanced Psychology of Adolescent Education	2 s.h.
Ed	513	Sociological Foundations of Education	2 s.h.
		or	
Ed	512	Philosophical Foundations of Education	2 s.h.
		or	
Ed	511	Historical Foundations of Education	2 s.h.
SS	510	New Approaches in Social Science Instruction	2 s.h.

III. Research (4-6 s.h.) Students must program a methods course early in their graduate work. This is followed by a seminar in which all theses or projects are initiated.

a. Methods (2 s.h.)

SS	514	Research Methodologies in Social Science
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or

Grad 515 Elements of Research

b. Seminar (2 s.h.)

c. Project or Thesis (0-2 s.h.)

MASTER OF ARTS IN SOCIAL SCIENCE

This degree is designed to prepare instructors of Junior College teaching. It emphasizes preparation in two of the seven Social Sciences (Criminology, Economics, History, Geography, Political Science, Psychology, Sociology-Anthropology) in a major-minor arrangement. Students program as interns in each of these fields in a course that stresses the organization, focus, teaching techniques and materials of the discipline in general education.

- I. Subject Matter (20-22 s.h.)
 1. Major Field (12-14 s.h.)
 2. Minor Field (8-10 s.h.)
- II. Professional Courses (4 s.h.)
 1. Internship: Major Field (2 s.h.)
 2. Internship: Minor Field (2 s.h.)
- III. Research Requirement (4-6 s.h.)
 1. Elements of Research or Research Methodologies in Social Science (2 s.h.)
 2. Seminar—Major Field (2 s.h.)
 3. Project or Thesis (0-2 s.h.)

Economics

Econ 501 Functions of Modern Economics 2 s.h.

(Not open to students who have credits of C or better in undergraduate Econ 121-122 sequence—Principles of Economics I and II— or equivalent.) Exposition of the discipline of Economics designed for the student who is not already well grounded in the field. Modern "mixed" capitalism, the price and market systems, and alternatives; national accounts concepts; full employment theory; economic stability; monetary and fiscal practices; product and factor pricing; and the significance of market model analysis.

Econ 525 Money, Banking, and Monetary Policy 2 s.h.

An examination of monetary economics: the structure and function of monetary institutions, including the Federal Reserve System, the commercial banks, and financial intermediaries, the theory of a monetary economy, and monetary policy.

Econ 551 International Economics 2 s.h.

The nature of the world economy, international trade, international investment, current international institutions, and the foreign economic policy of the United States. Prerequisite: Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Econ 552 Comparative Economic Systems 2 s.h.

Basic economic issues in capitalism, socialism, communism, and fascism, and their relationships to political and social problems. Prerequisite: Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Econ 553 Contemporary Economic Issues 2 s.h.

Attention will be centered on problem areas of the domestic economy in this course. The primary focus in each semester will be determined by student-instructor interest. Prerequisite: Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Econ 554 Economics Seminar 2 s.h.

Area research in the discipline, considering various facets of a central problem. Prerequisite: Grad 515, and Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Econ 555 Labor Economics 3 s.h.

A study of the problems involved in the relations between the workers and management in a dynamic industrial society, and the economic aspects

of the solutions proposed or attempted by labor, management, and the government. May not be programmed by students with undergraduate credit for Industrial Relations. Prerequisite: Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Econ 556 History of Economic Thought 3 s.h.

A study of the contribution of economic progress of the more prominent early philosophers, through to the modern economists; examining the various major schools of economic thought (Mercantilists, Physiocrats, Classicists, Socialists, Marginalists, Institutionalists, Neo-Classicalists, Keynesians, Post-Keynesians) and the impact of their thinking upon the present-day American economy. (Not open to students who have completed Econ 347.) Prerequisite: Econ 501, or credits of C or better in six (6) s.h. of Principles of Economics.

Political Science

PolS 510 Community College Teaching Internship 2 s.h.

A course designed especially to prepare Community College instructors through an emphasis on the objectives, materials, techniques and evaluation of general education programs in Political Science. Summer only.

PolS 560-565 Political Systems 2 s.h.

An intensive, comparative study of the government and politics of a selected region. PolS 572 Comparative Political Studies should be taken first, if possible.

PolS 560 Latin America (Chaszar)

PolS 561 Africa (Carone)

PolS 562 Asia

PolS 563 Middle East

PolS 564 Central and Eastern Europe (Platt)

PolS 565 Atlantic Community

PolS 571 Foreign Policy Studies 2 s.h.

This course considers selected problems in international affairs. Emphasis is placed on those problems and conflicts which have evolved in the post-war era, particularly as they relate to the position of the United States in World affairs. Specific problems are approached both in terms of the countries involved and in terms of the existing balance in the world economic, ideological, and power structure. (Platt)

PolS 572 Comparative Political Studies 2 s.h.

A course that considers the theory, structure, politics, and problems of selected foreign governments. Specific political ideas and governmental institutions are also analyzed from the comparative point of view. Special emphasis is placed on comparing and contrasting ideas and institutions with those of the United States. (Morris)

PolS 573 Regional Political Studies 2 s.h.

Examines the structure and function of state, county, and municipal governments. It emphasizes the problems faced by government at these levels and seeks solutions to these problems. Pennsylvania governmental forms are stressed but are contrasted with those of other states. (Heiges)

PolS 574 Political Science Seminar 2 s.h.

Area research in the discipline, considering various facets of a central problem. Prerequisite: Grad 515 or SS 514. (Staff)

PolS 575 American Political Parties 2 s.h.

This course will trace historically the development of American Political Parties. Major emphasis will be placed on modern party developments since 1900. May not be programmed by students who have undergraduate credit in American Political Parties. (Smith)

PolS 576 The Legislative Process 2 s.h.

A functional study of legislative bodies and the process of legislation, covering the organization of legislative assemblies, operation of the committee system procedures, bill drafting, aids, and controls over legislation. May not be programmed by students with undergraduate credit in Legislative process. (Lank)

PolS 577 Metropolitan Problems 2 s.h.

Analyzes the multiplicity of problems facing our metropolitan areas. Contemporary developments such as urban renewal, the shrinking tax base, federal aid to cities, subsidized mass transit, municipal authorities, and political consolidation are examined. Pennsylvania municipalities are contrasted with those of other states. May not be programmed by students with undergraduate credit in Metropolitan Problems. (Green)

PolS 578 American Constitutional Law 2 s.h.

A study of the development of constitutional law through leading Supreme Court decisions. Topics treated include the scope of federal powers, civil liberties and civil rights, the nature of judicial review, federal-state relations. Attention is given to the continuing controversy over the role of the Supreme Court in American Society. May not be programmed by students with undergraduate credit in Constitutional Law. (Keene)

PolS 579 Modern Political Thought 2 s.h.

The development of political thought since the mid-16th century. (Rousseau) Classic Liberalism of the Philosophic Radicals. Conservative thought since Burke. The nature and origin of modern irrational ideologies such as fascism and national socialism. Socialist thought (Marxist and non-Marxist). Contemporary collectivist liberalism. May not be programmed by students with undergraduate credit in Modern Political Thought. (Fine)

PolS 580 Public Opinion 2 s.h.

A study of the nature of public opinion within the political system. Attention is given to the formation of public opinion, expression, propaganda, mass media, and interest groups. May not be programmed by students with undergraduate credit in Public Opinion. (Green)

PolS 581 The Presidency 2 s.h.

An examination of the Office of President with attention to constitutional foundations, evolution, structure powers, and functions. Evaluation of the changing natures of the office within the American political system is stressed. Some comparisons are made between presidential and parliamentary systems and between the offices of President and Governor. May not be programmed by students with undergraduate credit in the Presidency. (Lank)

PolS 583 Federal Administrative Policy 2 s.h.

An intensive study of the role of federal agencies and their administrators in determining and developing public policy. Public administration in practice is emphasized by utilizing case studies. Previous course in Public Administration is desirable but not required. May not be programmed by students with undergraduate credit in Federal Administrative Policy. (Palmer)

PolS 584 Judicial Process 2 s.h.

Explores the nature and limits of judicial power, the courts as policy-making bodies, the selection of judges, the decision process, the external forces impinging on the courts, and the role of the Supreme Court in its relationship with Congress, the Presidency, and federalism. Judicial biographies and case studies are included. May not be programmed by students with undergraduate credit in Judicial Process. (Keene)

PolS 585 Political Philosophy 2 s.h.

The evolution of the Western political tradition of Constitutionalism from Plato and Aristotle to Locke and Montesquieu. The religious (Judeo-Christian) and rational (Graeco-Roman) foundations. Medieval theories of authority and representation in church and state. Early modern theories of the state and

sovereignty (Bodin and Hobbes). Emphasis on analysis of writings of leading theorists. Concepts of law, natural rights, liberty and equality, and justice are treated in detail. May not be programmed by students with undergraduate credit in Political Philosophy. (Fine)

PolS 590-591 Studies in Political Science ea. 2 s.h.

In depth study of a specific problem or topic not regularly treated in courses. Emphasis is on readings and writing papers assigned by instructor. (Staff)

PolS 599 Political Science Internship 1-6 s.h.

Practical experience in government and politics. Students are individually assigned to a cooperating local or state government agency, political party, or interest group, or to a federal or international agency when arrangements can be made. Examples: Assemblyman, Congressman, Community Action Program, Borough Manager, Planning Commission, Public Defender, Party Committee, CIO-AFL. Student will report periodically to Professor in charge, and undertake reading assignments and write such reports and papers as the Professor may require. Course credit hours will be determined by Department Chairman and by Professor in charge. Course grade will be determined by the Professor. (Staff) Prerequisite: Must have approval of instructor and Political Science Department Chairman. Course is offered only when arrangements for internship can be made with cooperating agencies and is normally available only to full-time students or during summer sessions.

NOTE: SS 514 (page 179)—Mr. Green also occasionally teaches this course.

Sociology-Anthropology

Soc 562 Deviant Behavior 2 s.h.

Crime as a social product. The social-individual analysis of criminal behavior, its treatment and prevention. Lectures, discussions, papers. Prerequisite: Principles of Sociology. (Newhill)

Soc 563 Intergroup Relations 2 s.h.

Intergroup tensions and conflicts will be the subject of study with the major emphasis upon techniques of social action designed to reduce conflict. Prerequisite: Principles of Sociology. (Shea)

Soc 564 Sociology Seminar 2 s.h.

Area research in the discipline, considering various facets of a central problem. Prerequisite: Grad 515. (Staff)

Soc 565 Adolescent in American Society 2 s.h.

A study of the American Adolescent in his varieties is attempted in this course. Because literature and research concern themselves mainly with the alleged pathologies of the American Adolescent and the dysfunctions of contemporary culture and society it is the task of the lecturer to abstract, with the help of discussion, that elusive "American Adolescent" who may become a non-delinquent as well as a delinquent. In doing so one must also view the contemporary American society and culture in this objective vein.

Anth 591 Studies in Anthropology 2 s.h.

A survey for graduate students of the evolution of man and culture, presenting the principal findings of physical and cultural anthropology. (Staff)

Anth 592 Comparative Cultures 2 s.h.

A comparative study of selected examples of the world's cultures, from primitive hunters to modern industrial systems, as adaptations to their geographical and social habitats. (Staff)

Anth 593 The Science of Culture 2 s.h.

An introduction to the major theories of cultural anthropology which are employed to account for the variety and structure of man's cultures. (Staff)

Anth 594 Anthropology Seminar 2 s.h.
Area research in the discipline, considering various facets of a central problem. Prerequisite: Grad 515. (Staff)

Anth 595 Pre History 2 s.h.
A survey of the evolution of man and culture in the Old and New World from the earliest fossil and cultural forms to the Archaic Civilizations. Prerequisite: Introduction to Anthropology. May not be programmed by students with undergraduate credit for Archaeology. (Staff)

Unclassified

SS 510 New Approaches in Social Science Instruction 2 s.h.
Starting with the conclusions developed from recent research in the several social sciences, a study will be made of the curricular and instructional changes, which have been proposed to close the gap between what we now know about human behavior and what is generally taught in social science courses. (Mervine)

SS 511 Social Science Seminar 2 s.h.
Research in the methodology of Social Science in the Secondary schools. Restricted to M.Ed. candidates. Prerequisite: Grad 515 or SS 514.

SS 514 Research Methodologies in the Social Science 2 s.h.
Selection of a research topic, techniques of locating and using source materials, the evaluation of evidence, the organization of the tested data, and the exposition of the tested data according to approved forms. Methodologies of value to students of politics, economics, or sociology will receive attention, in addition to those techniques usually treated in historiography. (Wahl)

SS 521 Contemporary American Issues 2 s.h.
This course will be conducted in seminar fashion, centering its attention on one or two major contemporary American issues. Open only to non-majors in the Social Sciences. (Lee)

SS 561 Social Policy Studies 2 s.h.
Focusing on several key issues on the American social scene, the class will examine the genesis of each problem, the present conflict of values inherent in the problem, the alternative proposals for its solution and the social consequences. Open only to non-majors in the Social Sciences. (Newhill)

SS 598-599 Contemporary Europe 2-6 s.h.
A study project devoted to the politics, economics, sociology, history and culture of Europe through direct observation. (Staff)

CONTEMPORARY EUROPE

The Social Science Division annually sponsors a study-tour of Europe during the Summer Session. This course, which carries 2-6 hours of graduate credit, emphasizes the economic, social, political, and military organization of the continent based on the historical development of the region. Interested students are invited to write to:

Contemporary Europe
Social Science Division
Indiana University of Pennsylvania
Indiana, Pennsylvania 15701

Course descriptions for all History courses may be found in this bulletin under the History section, those for Geography under the Geography section.

SPECIAL EDUCATION AND CLINICAL SERVICES

Morton Morris, Chairman

Marie K. Bahn	Marshall G. Flamm
Nelson H. Bormann	Marion M. Geisel
Maude O. Brungard	Richard P. Mease
Eugene A. Felix	L. Leon Reid
Jerry B. Fiddler	Eugene F. Scanlon

The graduate program offers specialization in two fields, with major curriculum concentrations available in Special Education (Mentally Retarded) or in Speech and Hearing. Each concentration area leads to the Master of Education degree. A graduate level of competency in these fields is in accord with national standards now emphasized by professional organizations such as the Council for Exceptional Children and the American Speech and Hearing Association.

Using the curriculum outlines provided below, students working for the Master's degree in Special Education (Mentally Retarded), or in Speech and Hearing, should select from fourteen to eighteen semester hours in their Subject Matter Concentration area (Group I). Student majors should also select from eight to twelve semester hours of course work in the area of Professional Studies and Electives (Group II). All degree candidates are required to select two semester hours in the area of Foundations of Education (Group III), and two semester hours in Grad 515, Elements of Research. The two semester hours in Elements of Research should be taken early in the student's program, for in this course plans for the thesis or research project may be started. However, it should not be scheduled at the very beginning of the program.

Admission to the Master's degree program assumes that certain subjects normally included in the undergraduate major have been successfully completed. In admission of majors in Special Education (Mentally Retarded), this would include basic undergraduate work in exceptionality, curriculum, educational psychology, mental hygiene, and human growth and development. A student with a deficiency may be admitted provisionally to the department with the understanding that deficiencies will be made up.

In admission of majors in Speech and Hearing, students must have completed at least eighteen (18) semester hours of certain subjects normally included in the undergraduate major. If a student lacks three (3) or more credits of prerequisites he may be provisionally admitted to the department and upon successful completion of the courses required to remove the deficiencies will be accepted to full graduate status.

SPECIAL EDUCATION AND CLINICAL SERVICES

Curriculum for the Master of Education Degree

I. Subject Matter Concentration

Two areas of Subject Matter Concentration are offered, each leading to the Master of Education Degree: (1) Special Education—Mentally Retarded; (2) Speech and Hearing

- (1) SPECIAL EDUCATION—select fourteen to eighteen (14-18) semester hours
- | | | | |
|-----|-----|---|--------|
| Psy | 539 | Psychology of the Mentally Retarded | 2 s.h. |
| SpE | 520 | Curriculum and Methods (Elementary) | 2 s.h. |
| SpE | 521 | Curriculum and Occupational Education
(Secondary) | 2 s.h. |
| SpE | 522 | Orientation to Rehabilitation | 2 s.h. |
| SpE | 530 | Organization and Administration of Programs
for Exceptional Children | 2 s.h. |

SpE	535	Guidance and Adjustment	2 s.h.
SpE	540	Diagnostic Techniques in Special Education	2 s.h.
SpE	541	Interpretation of Psychological Test	2 s.h.
SpE	545	Community and Agency Planning	2 s.h.
SpE	555	Practicum and Internship	2-4 s.h.
SpE	560	Selected Problems and Research	2 s.h.
SpE	565	Education of Children with Social and Emotional Maladjustments	2 s.h.

(2) SPEECH AND HEARING—select fourteen to eighteen (14-18) semester hours

A. Basic Area (select 2 s.h. of course work in this area)

SpH	550	Speech Science	2 s.h.
SpH	650	Experimental Phonetics	2 s.h.

B. Speech Concentration

SpH	504	Diagnostic Methods	2 s.h.
SpH	510	Articulation	2 s.h.
SpH	512	Cleft Palate	2 s.h.
SpH	514	Cerebral Palsy	2 s.h.
SpH	516	Stuttering	2 s.h.
SpH	518	Voice	2 s.h.
SpH	530	Childhood Aphasia	2 s.h.
SpH	532	Adult Aphasia	2 s.h.

C. Hearing (select 2-4 s.h. in this area)

SpH	540	Advanced Audiology	2 s.h.
SpH	640	Theories of Hearing	2 s.h.

D. Advanced Clinic Practicum (select 4-6 s.h. in this area; a minimum of 6 s.h. of graduate work are prerequisite)

SpH	561	Advanced Clinical Practicum I	2-3 s.h.
SpH	663	Advanced Clinical Practicum II	2-3 s.h.

II. Professional Studies and Electives—select eight to twelve semester hours (8-12 s.h.) according to major subject matter concentration.

Psy	531	Psychology of the Exceptional Child	2 s.h.
Ed	522	Principles and Practices in Speech Improvement	2 s.h.
CnEd	531	Philosophy and Principles of Guidance	2 s.h.
CnEd	533	Evaluation Methods in Guidance I	2 s.h.
CnEd	534	Evaluation Methods in Guidance II	2 s.h.
Psy	530	Psychology of Growth and Development	2 s.h.
Psy	532	Studies in Child Adjustment and Guidance	2 s.h.
Psy	533	Psychology of Personality	2 s.h.
Psy	534	Abnormal Psychology	2 s.h.
Psy	535	Differential Psychology	2 s.h.
Psy	536	Psychology of Learning	2 s.h.
Psy	538	Psychology of the Gifted Child	2 s.h.
Psy	540	Advanced Mental Hygiene	2 s.h.
Ed	534-535	Diagnosis and Remediation in Reading	2-4 s.h.
Grad	516	Statistical Methods I	2 s.h.
Grad	517	Statistical Methods II	2 s.h.
Grad	550	Thesis	2-4 s.h.

III. Foundation of Education—select two semester hours (2 s.h.)

Ed	511	Historical Foundations of Education	2 s.h.
Ed	512	Philosophical Foundations of Education	2 s.h.
Ed	513	Social Foundations of Education	2 s.h.

IV. Research—two semester hours (2 s.h.) required.

Grad	515	Elements of Research	2 s.h.
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Course Descriptions

(1) SPECIAL EDUCATION (Mentally Retarded)

- Psy 531 Psychology of the Exceptional Child** 2 s.h.
This course is designed to aid the student in meeting the needs of those children who deviate from the typical in areas of physical, mental, emotional, and educational developments. Consideration will be given to methods of instruction and curricular material. (Morris)
- Psy 538 Psychology of the Gifted Child** 2 s.h.
Characteristics of the bright, fast-learning child will be explored along with implications for education. Emphasis will also be given to measurement techniques. Motivational factors, and personality dynamics.
- Psy 539 Psychology of the Mentally Retarded** 2 s.h.
Characteristics of the slow-learner and of the non-educable child will be explored along with implications for education. Emphasis will also be given to measurement techniques, motivational factors and personality dynamics.
- SpE 520 Curriculum and Methods (Elementary)** 2 s.h.
This is a basic course dealing with the design of curricular content, selection of instructional materials, and procedures at elementary age levels. Curriculum development and selected activities designed for retarded pupils are analyzed according to sequence and relevance of content, and levels of social maturity among pupils. Representative curricula are evaluated according to specified criteria. Prerequisite: Psy 531, Psy 539.
- SpE 521 Curriculum and Occupational Education (Secondary)** 2 s.h.
This course considers adjustments in regular organization and curriculum which are specifically designed for retarded youth of secondary school age. Emphasis is placed upon content and procedures for developing attitudes, knowledge, and skills among pupils, in preparation for post-school adjustments to suitable work situations and responsible adulthood. Prerequisite: Psy 531, Psy 539.
- SpE 522 Orientation to Rehabilitation** 2 s.h.
Principles and practices in rehabilitation are introduced, with attention given to the contributions of teachers, counselors, nurses, social workers, psychologists, speech therapists, and other professional workers.
- SpE 530 Organization and Administration of Programs for Exceptional Children** 2 s.h.
Principles, practices, and problems of administration and supervision are considered as they relate to developing and maintaining special education programs. Criteria are analyzed for use in evaluation of local programs. The functions of administrators and supervisors in school systems are compared according to rural, urban, or state-wide responsibilities. Prerequisite: SpE 520, 521, 540. (Required for administrators and supervisors)
- SpE 535 Guidance and Adjustment** 2 s.h.
Home, school, and community influences are analyzed in family adjustment to the presence of a retarded child. Family reactions are considered in behavioral differences among children with moderate and severe degrees of retardation. Emphasis is given to guidance skills and knowledges needed by teachers and other professional workers in the field of mental retardation.
- SpE 540 Diagnostic Techniques in Special Education** 2 s.h.
Diagnostic procedures and appropriate test materials are selected for use in assessment of pupils with mental and physical limitations. Observations and demonstrations are analyzed critically. Reporting and interpreting results of diagnostic procedures are integrated with remedial or developmental recommendations in individual case studies. Prerequisite: Psy 531, Psy 539.

SpE 541 Interpretation of Results of Psychological Tests 2 s.h.

Results of psychometric tests are analyzed and interpreted. Various standardized psychological instruments and test batteries are considered in the light of their purpose and usage. Both individual and group test results are examined critically.

SpE 545 Community and Agency Planning 2 s.h.

Selected professional, governmental and community organizations are studied for their contributions to comprehensive planning toward educational, personal-social, and occupational adjustments of the mentally retarded. Social, economic, and cultural aspects are analyzed.

SpE 555 Practicum and Internship 2-4 s.h.

Advanced students are offered guided practicum experiences in selected schools, residential institutions, clinics, or agencies. Internship or supervised student teaching is planned individually. Students analyze, evaluate, and report on their experiences.

SpE 560 Selected Problems and Research 2 s.h.

Major theories and practices in special education are evaluated. Students have an opportunity to review critically recent developments in the field. Opportunity is afforded for independent readings and limited research reports. A student may identify a topic for subsequent development as his thesis or research project. Prerequisites: Psy 539, SpE 540.

SpE 565 Education of Children with Social and Emotional Maladjustments 2 s.h.

This course examines reactions of children in the schools who deviate in their emotional or social behavior. Consideration is given to children who habitually exhibit overcontrolled, undercontrolled, or immature reactions. Identification, characteristics, educational provisions, and preventive measures are emphasized.

(2) SPEECH AND HEARING

(Students working for the Master of Education Degree with a major in Speech and Hearing will complete a minimum of thirty (30) semester hours in the total program. In the area of subject matter concentration, fourteen to eighteen (14-18) semester hours will be required, with at least two (2) semester hours in the basic area, two to four (2-4) semester hours in the hearing area and from four to six (4-6) in clinical practicum. At least six (6) semester hours of graduate work are prerequisite to enrollment in practicum courses.)

A. Basic Area**SpH 550 Speech Science 2 s.h.**

A physiological, neurological, and acoustical study of the communicative process with special attention to speech monitoring, controls and perception. Emphasis will be placed on current research methodology, clinical instrumentation, and laboratory techniques.

SpH 650 Experimental Phonetics 2 s.h.

An application of laboratory and research techniques in phonetics; developments of palatograms; experience in use of the polygraph; kymograph, pneumagraph and other electronic equipment; analysis of the recordings and their significance in diagnosis and therapy.

B. Speech Concentration**SpH 504 Diagnostic Methods 2 s.h.**

A compilation and evaluation of diagnostic resources applicable to evaluation of speech disorders bases for selection of appropriate materials in differential diagnoses; interpretation of test results and their significance in planning future therapy.

SpH 510 Articulation

2 s.h.

Advanced study of speech production with major emphasis on the articulatory mechanism and its functioning in relationship to the total speech process; recognized etiologies, diagnoses, and symptomatologies of articulatory disorders. Various methods of treatment, their rationale, appropriate use and adaptation to group or individuals. Critical review of selected topics of research.

SpH 512 Cleft Palate

2 s.h.

A study of the embryology of the facial and cranial skull with emphasis on the development of the oral pharyngeal structures associated with speech; theories of etiology, classifications of lip and palatal clefts; methods of surgical and prosthetic repair with consideration to the appropriateness and feasibility of a specific procedure; principles and methods of speech and language training.

SpH 514 Cerebral Palsy

2 s.h.

The neuropathology of the central nervous system as associated with types of cerebral palsy; the basis for sensory-motor and perceptual disabilities and speech and hearing handicaps; the emotional, intellectual, physical and psychological problems of the cerebral palsied individual and the means and methods of his habilitation with emphasis on the role played by the speech and hearing therapist in this habilitation.

SpH 516 Stuttering

2 s.h.

An intensive study of the nature of the stuttering disorder and its effects in the dynamics of personality development, evaluation of prevalent causal theories and their implications for both symptomological and psychological methods of treatment as adapted to individuals or group situations. Review of pertinent and recent research topics.

SpH 518 Voice

2 s.h.

An advanced study of the theory of voice production with emphasis on physiology, pathology and malfunctioning which produce voice defects; the possible relationship of disorders of voice and disorders of personality; diagnostic methods and therapeutic considerations for both organic and psychogenic disorders. Special attention will be given to therapy for the laryngectomized.

SpH 530 Childhood Aphasia

2 s.h.

Review of factors in differential diagnosis, characteristics, and capacities of aphasic children and means of assessing them; principles and techniques of teaching including the Association Method; approaches to helping parents understand the problems of the aphasic child.

SpH 532 Adult Aphasia

2 s.h.

Consideration of trauma and of cerebro-vascular accident in relation to aphasia and brain function, methods of diagnosis and evaluation of the sensory and motor skills with emphasis on the communication function; the impact of speech and language loss on personality; and principles and techniques of speech and language relearning with attention to the influence of psychological and physiological factors on the relearning process.

C. Hearing**SpH 540 Advanced Audiology**

2 s.h.

The identification of types of hearing loss by special audiological tests—speech audiometry, Bekesy, SAL, tone decay, PGSR; interpretation of the audiogram and its relevancy to diagnosis and remedial procedures; functions and characteristics of hearing aids with respect to speech reception and discrimination.

SpH 640 Theories of Hearing

2 s.h.

An intensive review of the neurophysiology of the auditory system; the cochlea as a sound analyzer; pathways from cochlea to cerebral cortex;

experimental studies on the auditory systems of animals and electrical potentials of nerve action.

D. Advanced Clinical Practicum

SpH 561 Advanced Clinic Practicum I 2-3 s.h.

Supervised clinical practice with children and/or adults exhibiting functional or organic speech and hearing problems of varying degrees of severity; diagnosis of problems and acceptance of responsibility for planning complete programs of habilitation, stressing the speech and language area. Interviewing, counseling and report writing will be included. Two clock hours per credit.

SpH 663 Advanced Clinic Practicum II 2-3 s.h.

Students will be expected to assume full responsibility for interviewing, diagnosing, counseling, planning a program of either individual or group therapy and implementing it for persons exhibiting either functional or organic speech or hearing problems of a moderately severe nature. Reports will be required, but actual supervision should be held to a minimum. Two clock hours per semester hour.

INDEX

Academic Load	31
Admission to Graduate Study	
Procedure	31
Policy	31
When to Apply — See Calendar	4
Admission to Candidacy for a Degree	37
Advanced Graduate Study Beyond Master's Degree	45
Advisory System	34
Administration	2
Auditors	34
Calendar	4
Class Cancellation	33
Class Schedules	
Spring Semester, 1972	7
Pre-Summer Session, 1972	12
Main Summer Session, 1972	13
Post-Summer Session, 1972	16
Fall Semester, 1972	17
Spring Semester, 1973	21
Computer Center	28
Counselor Education Certification	76
Department Chairmen	3
Department Curricula, Instructions and Course Descriptions	
Art	54
Biology	59
Business	65
Chemistry	71
Counseling and Guidance	76
Educational Psychology	81
Elementary	86
English	98
Romance and Classical Languages	109
General Services	112
Geography	115
GeoScience	120
Health and Physical Education	124
History	125
Home Economics	128
Learning Resources and Mass Media	133
Mathematics	137
Mathematics for the Elementary School Teacher	143
Music	147
Philosophy	152
Physics	153
Psychology	158
Science	162
Science for the Elementary School Teacher	164
Social Science	168
Special Education and Clinical Services	175

Doctor's Degree	45
Doctor of Education	45
Doctor of Philosophy	49
Fees	32
Financial Aid	
Assistantships	28
Counselorships for Men	29
Counselorships for Women	29
Scholarships	28
Forms	
Application for Admission	183
Application for Admission to Candidacy	187
Application for Graduation	195
Request for Placement Service	191
Request for Transcript	185
Research Approval Form	193
Full-time Students	32
Graduate Council	2
Graduation (Application)	35
Graduate Record Examination	31
History of Graduate School	26
Housing Facilities	30
Internship in Elementary Education	93
Learning Research Center	27
Library	26
Location	26
Part-time Students	32
Permanent Certification Requirements	35
Placement Service	28
Principal's Certification	36
Programming and Registration	32
Reading (Graduate Study)	89
Refunds	33
Research Requirement	39
Residence	38
Scholarship Requirement	33
Semester Hours Required	38
Student Responsibility	34
Time Limit	38
Transfer of Credit	34
Transcript Service	35
University Catalog	26
Veterans	29
Withdrawal from Classes	33

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