STATE UNIVERSITY OF NEW YORK

AT STONY BROOK

THE GRADUATE SCHOOL

ADDENDUM TO THE GRADUATE BULLETIN

(SPRING, 1965)

The introduction of several new graduate courses of study has made the current Graduate School Bulletin seriously out of date. A new Bulletin is presently in preparation. Until it is ready for distribution, information concerning new programs and revisions in existing programs is contained in this addendum.

Financial Support

Teaching assistantships are available, with stipends of $2,575 for half-time duties and with tuition exemption, for the 1965-66 academic year.

Research assistantships for advanced graduate students and fellowships are also available.

Teaching assistantships, research assistantships and fellowships are awarded on a competitive basis by the Graduate School on recommendation of the department.

State University of New York at Stony Brook participates in the following Federal fellowship and traineeship programs: NSF Cooperative Graduate Fellowships, NDEA Fellowships, NSF Traineeships, and NASA Traineeships.

Faculty

The names of faculty added to current programs since the publication of the last Graduate School Bulletin, and the names of the faculties of new programs are listed below by departments:

College of Arts and Sciences

Biology: Cirillo, Vincent P., Associate Professor
Ph.D., University of California at Los Angeles

Jones, Raymond F., Associate Professor
Ph.D., Kings College, University of Durham (Newcastle Div.), England

Hechtel, George J., Assistant Professor
Ph.D., Yale University

Rosenberg, Marvin J., Assistant Professor
M.S., Cornell University

Chemistry: Hirota, Noboru, Assistant Professor
Ph.D., Washington University

English: Alexander, Peter, Professor
M.A., University of Glasgow

Creed, Robert P., Associate Professor
Ph.D., Harvard University

Fiess, Edward, Associate Professor
Ph.D., Yale University

Goldberg, Homer, Associate Professor
Ph.D., University of Chicago

Jordan, Robert M., Associate Professor
Ph.D., University of California, Berkeley

Kazin, Alfred, Professor
Litt.D., Adelphi University

Levin, Richard, Professor
Ph.D., University of Chicago

Ludwig, Jack, Professor
Ph.D., University of California at Los Angeles

Marsh, Robert, Associate Professor
Ph.D., Johns Hopkins University

Pequigney, Joseph, Assistant Professor
Ph.D., Harvard University

Rogers, Thomas, Associate Professor
Ph.D., University of Pennsylvania

Stampher, Judah L., Associate Professor
Ph.D., Harvard University

History: Angress, Werner T., Associate Professor
Ph.D., University of California, Berkeley

Cespedes Del Castillo, Guillermo, Professor
Ph.D., University of Madrid

Cleland, Hugh G., Associate Professor
Ph.D., Western Reserve

Lee, Robert H.G., Assistant Professor
Ph.D., Columbia University

Pratt, John W., Assistant Professor
Ph.D., Harvard University

Rosenthal, Joel T., Assistant Professor
Ph.D., University of Chicago

Ross, Stanley R., Professor
Ph.D., Columbia University

Semmel, Bernard, Professor
Ph.D., Columbia University

Staudenraus, Philip J., Associate Professor
Ph.D., University of Wisconsin

Wildman, Allan K., Assistant Professor
Ph.D., University of Chicago

Mathematics: Barcus, William, Associate Professor
Ph.D., Oxford University

Bell, Harold, Assistant Professor
Ph.D., Tulane University

Cornell, Ross, Assistant Professor
Ph.D., Cornell University

Elyash, Ernest, Associate Professor
Ph.D., Cornell University

Fox, William C., Associate Professor
Ph.D., University of Michigan

Kravetz, Saul, Associate Professor
Ph.D., Harvard University

Kumpel, Paul, Assistant Professor
Ph.D., Brown University

Kuo, Mrs. C.H., Assistant Professor
B.S., National Taiwan University

Lister, William, Professor
Ph.D., Yale University

Tennenbaum, Stanley, Associate Professor
Ph.B., University of Chicago

Zaustinsky, Eugene, Associate Professor
Ph.D., University of Southern California

Physics: Dresden, Max, Professor
Ph.D., University of Michigan

Toll, John S., Professor
Ph.D., Princeton University

College of Engineering

Engineering Analysis: Tewarson, Reginald P., Assistant Professor
Ph.D., Boston University

Thampuran, Devikumara V., Associate Professor
Ph.D., University of Wisconsin

Material Sciences: Jach , Joseph, Associate Professor
D.Phil. (Oxon.)

Levine, Sumner N., Professor
Ph.D., University of Wisconsin

Mukherjee, Kalinath, Assistant Professor
Ph.D., University of Illinois

Rosenberg, Robert, Assistant Professor
Eng.Sc.D., New York University

Thermal Sciences: Lee, Richard S., Associate Professor
Ph.D., Harvard University

General Information

The Biology Department has acquired a station at Flax Pond on Long Island Sound, near the campus, to be developed for instruction and re-

search in marine biology.

The Physics Department is installing a king tandem Van de Graaf accelerator for research in nuclear structure and reactions. The installation is scheduled for completion in late 1966.

Prof. Oliver A. Schaeffer, Ph.D., Harvard University, Chairman of the recently created Department of Earth and Space Sciences, will offer courses in cooperation with the Chemistry and Physics Departments to graduate students enrolled in these two departments.

Computer Center equipment described in the last Bulletin has been replaced by an IBM 7040/1401 computing system, with 32,768 words of main storage in the 7040 computer; eleven magnetic tape units, one connected to a high speed automatic plotter; and associated peripheral equipment. With the rapidly expanding requirements for computer facilities at Stony Brook, it is expected that the Computer Center will acquire larger and faster equipment in the near future.

New Programs

Admission and degree requirements, and course offerings for the new graduate degree programs in English, History, and Mathematics in the College of Arts and Sciences, and in the Department of Material Sciences, College of Engineering are described on the pages that follow.

GRADUATE PROGRAM IN ENGLISH

Admission to Graduate Study.

1. Applications for admission to graduate study in English shall be accompanied by an official transcript of undergraduate record, letters of recommendation from three previous instructors, the results of the Graduate Record Examination, and, wherever possible, an interview with a graduate advisor in the Department. When an applicant has been accepted by the Department, the Chairman of the Department will recommend his admission to the Dean of the Graduate School.

2. Undergraduate requirements for admission shall normally include:

    a) A Bachelor's degree from a recognized institution.

    b) An average of at least B in undergraduate literature courses.

    c) Proficiency in a foreign language equivalent to two years of college work.

Note. Any deficiences in these requirements shall not automatically bar admission; but it is understood that inadequacies in undergraduate preparation will normally require the student to take additional work, the amount to be determined by the Graduate Committee, and not to be used to fulfill any of the specific M.A. degree requirements.

Requirements for the Degree.

Satisfying the minimum requirements, as set forth below, will not guarantee a degree. The final departmental decision as to the awarding of the degree will be made by the Graduate Committee.

1. Course Requirements: eight one-semester courses, normally amounting to 24 credit hours, including the following:

    a) (1) One graduate English course in the literature of a period.

(2) One graduate English course devoted to one or two authors.

b) English 499. Independent studies.

c) Five additional courses, at least four of which are to be in English. One may be a graduate or advanced undergraduate (300-level) course in a field related to English. No more than two 300-level courses will be counted toward the degree.

Note 1. Before his Master's degree is granted the student will be required to have taken one course in Shakespeare and one course in Chaucer or Milton. Such a course on the graduate level will fulfill the requirement of 1, a), (2) above.

Note 2. Performance. An average grade of B in all course work is the minimum required, but no more than two C's will be permitted.

2. M.A. Paper. Each student must write a substantial (25 to 35 page) scholarly or critical study on an approved topic, normally as part of his work in English 499.

3 The Departmental Examination. The written departmental M.A. examination will be designed to test the student's mastery of scholarly and analytic techniques.

4. Foreign Language Proficiency. The student must demonstrate as early as possible his ability to read literary texts of moderate difficulty in one approved foreign language.

General Procedures and Regulations.

1. Departmental Graduate Committee. Members of the Department assigned to teach graduate courses will constitute a departmental Graduate Committee: (a) to evaluate the qualifications of pros-

pective students, (b) to supervise the departmental examination, and (c) to make final departmental recommendations to the Dean of the Graduate School for the granting of the degree.

2. The Advisor. Each prospective M.A. candidate will be assigned an advisor who will supervise his work in the program.

3. Residence Requirements and Time Limitations. All the requirements for the degree must be completed within a period of two years from initial admission to graduate study in the department, except where in the opinion of the department Graduate Committee extraordinary circumstances warrant exceptions to this rule.

Note. Teaching assistants will be considered in full-time residence.

Courses to be offered.

English 306. Middle English Literature.

Study of major works of prose, poetry, and drama of the fourteenth and fifteenth centuries, exclusive of Chaucer, in Middle English.

Mr. Jordan Spring, 3 credits

English 313. Tudor and Stuart Drama.

Study of representative plays of the major dramatists (excluding Shakespeare) and genres from the beginnings of English secular drama to the closing of the theaters in 1642.

Mr. Levin, Mr. Stampfer — Fall, 3 credits

English 315. Elizabethan Poetry.

Readings in Ralegh, Spenser, Sydney, Daniel, Davies, Marlowe, and Shakespeare.

Mr. Stampfer, Mr. Pequigney — Fall, 3 credits

English 333. English Drama, 1660-1780.

Comparative analysis of representative works of the major dramatists from Dryden to Sheridan with emphasis on the diverse forms of serious drama and the changing conception of comedy.

Mr. Goldberg — Spring, 3 credits

English 344. Romantic Revival.

The French Revolution (the aftermath of the American); its influence on Wordsworth and Coleridge; their development as poets; the relation of Keats and Shelley to the Romantic movements; the criticism associated with the movement; its prose.

Mr. Alexander — Fall, 3 credits

/English 366. William Butler Yeats/

Readings in the poetry, plays, autobiographies, and letters.

Mr. Ludwig — 3 credits

To be offered 1966-67

English 371. Proseminar in Major American Authors I.

Intensive study of major American writers of the earlier nineteenth century.

Mr. Kazin — Fall, 3 credits

English 372. Proseminar in Major American Authors II.

Intensive study of major American writers of the later nineteenth and twentieth centuries.

Mr. Kazin — Spring, 3 credits

English 375. Major American Poets.

Studies in American poetry from Emerson to Robert Frost.

Mr. Kazin — Spring, 3 credits

English 381. History of Literary Criticism I.

Analytic survey of major texts in the history of European literary theory and criticism from ancient times through the middle ages.

Mr. Jordan, Mr. Marsh, Staff — Fall, 3 credits

English 382. History of Literary Criticism II.

Analytic survey of major texts in the history of European literary theory and criticism from the early Renaissance to the present. May be taken independently of English 381.

Mr. Jordan, Mr. Marsh, Staff — Spring, 3 credits

[English 394. Satire and the Satiric Spirit]

Critical analysis of satire and the satiric spirit from Aristophanes through Horace, Juvenal, and Persius, to writers such as Chaucer, Rabelais, Ben Jonson, Moliere, Dryden, Swift, Voltaire, Pope, Byron, Stendhal, Flaubert.

Mr. Ludwig — 3 credits

To be offered 1966-67

B. Courses primarily for graduate students. In extraordinary cases qualified undergraduates may be admitted to these courses.

English 401. Introduction to Old English Language and Literature.

After a brief introduction to the language, the student will read in Old English and discuss a number of shorter Old English poems from Caedmon's Hymn to The Battle of Maldon.

Mr. Creed — Fall, 3 credits

English 402. Beowulf.

An intensive study, largely from a literary point of view, of the Old English original of this earliest recorded English epic.

Prerequisite: English 401

Mr. Creed — Spring, 3 credits

/English 406. Studies in the Medieval Period./

A study of major works of the Middle English period (exclusive of Chaucer) in relation to the traditions of chivalry and Christianity. Readings will include Pearl, Sir Gawayne and the Green Knight, Malory's Death of Arthur, and selected lyrics.

Mr. Jordan, Mr. Creed

To be offered 1966-67 — Fall, 3 credits

English 407. Special Topics in Chaucer.

A study of the principles of unity in the Canterbury Tales. Chaucer's works will be examined in the light of modern and medieval conceptions of poetic unity.

Mr. Jordan — Spring, 3 credits

English 412. Special Topics in Shakespeare.

The development of the Elizabethan theatre; the London companies; Shakespeare's early theatrical connections; his development as a dramatist with special reference to selected plays.

Mr. Alexander, Mr. Levin, Mr. Stampfer — Fall, 3 credits

English 413. Special Topics in Tudor and Stuart Drama.

This course each year will focus upon some specific topic in the field of Tudor and Stuart drama (exclusive of Shakespeare). The special topic for 1965-66 will be the use of the double plot.

Mr. Levin — Fall, 3 credits

/English 415. Shakespeare's Roman Tragedies./

This course will focus upon one area of Shakespeare's genre writing, its sources, its plots, and its sense of political legitimacy; Shakespeare's evolving sense of Rome as a civilization.

Mr. Stampfer — 3 credits

To be offered in 1966-67.

English 428. Andrew Marvell.

Marvell's poetry will be studied, analytically and in the contexts of history and his biography, of literary traditions and critical commentaries.

Mr. Pequigney — Spring, 3 credits

/English 435. Alexander Pope./

Study of Pope's major poems, translations, and miscellaneous prose, in the context of his life and times.

Mr. Marsh

To be offered in 1966-67 — 3 credits

[English 436. Studies in the Later Eighteenth Century.]

Extensive examination of the prose and poetry of the second half of the eighteenth century, with special attention to the immediate antecedents of the Romantic movement.

Mr. Rogers, Mr. Marsh

To be offered in 1966-67 3 credits

English 437. Studies in Eighteenth Century Fiction.

Critical investigation of the four major midcentury novelists (Richardson, Fielding, Smollett, and Sterne) and the current state of scholarship in the field, with emphasis on relationships and distinctions among the latter three.

Mr. Goldberg Fall, 3 credits

English 441. Studies in Romantic Poetry.

An examination of the major poems of Blake, Wordsworth, Keats, stressing the revolutions in poetry and philosophy which marked this period.

Mr. Kazin, Mr. Marsh 3 credits

/English 458. Matthew Arnold./

An analysis of Arnold as a critic of Victorian culture, a literary critic, and poet, emphasizing his place in scientific, religious, literary and educational controversy.

Mr. Ludwig 3 credits

To be offered 1966-67

English 465. Joyce.

An intensive study of Ulysses with all of Joyce's other works brought into the discussion.

Mr. Ludwig Fall, 3 credits

/English 475. Selected American Writers./

The seminar will be devoted to a parallel examination of the works and characters of Hawthorne and Melville with special attention to their methods and literary invention. Their relationships with other literary contemporaries will be thoroughly explored.

Mr. Kazin, Mr. Fiess 3 credits

To be offered 1966-67

English 476. Melville.

The seminar will concern itself with all of Melville's work; prior acquaintance with Melville's more familiar works like Moby Dick will be assumed. Textual, biographical and critical approaches will be used.

Mr. Fiess Spring, 3 credits

/English 483. The Structure and History of the English Language./

A study, employing the techniques of modern Linguistics, of the structure of present-day American English, with some attention to selected earlier periods for comparison.

Mr. Creed 3 credits

To be offered 1966-67

STATE UNIVERSITY OF NEW YORK
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****
DEPARTMENT OF HISTORY

GRADUATE PROGRAM

1. ADMISSION TO GRADUATE STUDY

For admission to graduate study in history, the following are required:

A. a baccalaureate degree in history, or its equivalent.
B. a minimum grade-point average of 2.75 (B-) in all undergraduate course work, and 3.00 (B) in history courses.
C. acceptance by the Department of History and the Graduate School.

In special cases, students not meeting requirements (A) and (B) may be admitted on a provisional basis.

Students who hold an M.A. degree from another accredited institution wanting to enroll for the Ph.D. program at Stony Brook will be admitted subject to the approval of the Dean of the Graduate School and the Department of History.

2. DEGREE REQUIREMENTS

a) Master's Degree:

The Master's degree requires at least one year (two semesters) of residence. It may be obtained either under Plan "A" or Plan "B". Plan "A" requires thirty hours of work, including a thesis, which carries six hours of credit, and a comprehensive oral examination. Plan "B" requires thirty-six hours of work and a comprehensive written examination. Under both plans, the candidate must also prove his proficiency in one foreign language by taking an examination no later than the beginning of his second semester in residence. For details, see Section 3.

b) The Doctor of Philosophy degree:

The Ph.D. degree requires at least one year (two semesters) of residence, beyond the M.A. During each semester of residence the student must ordinarily take twelve credits per semester. He must prove his proficiency in a second foreign language prior to taking his general examinations, and he must write a dissertation. The general examinations will test the student's proficiency in two minor fields by means of written examinations, and in his major field by means of an oral examination. For details, see Section 4.

3. THE MASTER OF ARTS (M.A.) DEGREE

The department offers two programs leading to the M.A. Plan A, which includes a thesis, is required for students who go on to seek the doctorate and may be elected by other students if they choose. Plan B requires additional hours of course work and a more extensive examination. It is a terminal degree. Students may elect Plan B only with the approval of the Graduate Committee of the Department of History.

The department requires graduate students to fulfill the work for the Master's degree under Plan A by taking 30 (thirty) hours of work, by writing a thesis and by passing an examination in a foreign language and a comprehensive oral examination.

The 30 hours of work must include the following:

> Research seminars in two different major fields; reading seminars in two different major fields; an historiography course; six hours of thesis credit; and additional course work to make up 30 hours.

The student may also be required, at the discretion of the graduate advisor, to audit additional courses (without credit) in history or in a cognate field.

The M.A. oral examination committee will be composed of at least three members of the faculty, appointed by the graduate dean of the university in consultation with the chairman of the department.

The oral examination for the M.A. will consist of a defense of the thesis and an oral examination in the major field of history in which the thesis falls, with special attention to sources for the thesis.

The candidate for a M.A. degree should select his thesis topic as soon as possible after beginning his graduate studies. The topic must be approved by the faculty member under whose supervision the student is writing his thesis. The thesis committee will ordinarily be composed of the same three members who also administer the M.A. examination. The committee should include the thesis supervisor as chairman.

The department requires graduate students to fulfill the requirements under Plan B by taking 36 hours of work and passing an examination in a foreign language, and a comprehensive written examination in one major and one minor field of history. The 36 hours of work must include the following: research seminars in two different fields; reading seminars in two different fields; and an historiography course. The M.A. under Plan B is a terminal degree. Students with this degree will not be permitted to enroll in a doctoral program.

4. THE DOCTOR OF PHILOSOPHY (Ph.D.) DEGREE

The Ph.D. is not a degree which can be obtained by satisfying course requirements. The chief specific tasks of the student are to prepare for his qualifying examinations and to write his dissertation. However, to insure adequate preparation for the qualifying examinations, the student will ordinarily take course work in his minor fields as well as in his major thesis field.

Ph.D., preliminary review -- When a student has completed his work for the M.A. degree, his record will be reviewed by the departmental Graduate Committee. Unless the student's record promises success in the more difficult and more independent work for the Ph.D., he will be discouraged from further graduate study in history.

During the year preceding his general Ph.D. examinations, the student will be expected to do intensive reading in his major field and his two minor fields. He will take 12 (twelve) credits per semester (9 if he is a teaching or research assistant).

The 24 units of work will ordinarily include four reading seminars, two per semester. A student who has taken his M.A. degree at another institution may be required by the department to take a research seminar as well.

All the Ph.D. students will be required to take a one-hour non-credit course in Teaching History at the College Level. This will usually be done in connection with section teaching in the History of Western Civilization or U.S. History.

Ph.D., language requirements -- A reading knowledge of two foreign languages is required. One of these will ordinarily be either French or German. However, the department may permit the student to substitute any other foreign language, provided there exists a rich scholarly literature in it, or it is demonstrably necessary for the student's research.

It is strongly recommended that the student complete his language preparation before commencing the doctoral program. Language proficiency is necessary for course work as well as seminar work. In any event, he should take his language examinations as early in his program as possible. A student will not be permitted to take the general examination until he has passed the required language examinations.

Ph.D., selection of fields -- The student must choose for special study a major field and two minor fields of history. A major field consists of the whole of one of the fields in the list which follows, and is usually the field within which the student will write his dissertation. A minor field consists of a subdivision of one of the major fields, as determined by the advisor in consultation with the student and an instructor in the minor field. In some cases, the major field selected will determine one of the minor fields (e.g., if a student's major field is Late Modern Europe, he must offer a segment of Early Modern Europe as one of his minor fields.)

One of the two minor fields, moreover, must be taken outside the geographic area of the student's major field; e.g., if his major field is U.S. History, one of his minor fields should be either in Far Eastern, European, or Latin American History. The minor fields will be passed by a written examination, and the major field by an oral examination.

Admission to Doctoral candidacy -- A student will be considered a candidate for the doctorate after he has met his language requirements and passed his general examination. After admission to candidacy, a student will register for dissertation credits in consultation with his adviser.

5. M.A. AND Ph.D. FIELDS OF EXAMINATION

The divisions constitute the major fields, whereas the minor fields and the dissertation fields will be chosen from the various subheadings listed below the divisions. Thus a student's major field may be Division III (Modern Europe); one of his minor fields may be "The Age of Enlightenment and Revolution, 1648-1815," and the other "United States 1850 to the Present," while his dissertation field may be "Modern England since 1760."

At present, the department is equipped to offer examinations in all six divisions, but can offer dissertation fields only in U.S., Modern European and Latin American History.

Division I: Ancient and Medieval

1) The Ancient World: Western Asia, Greece & Rome
2) The Medieval World, 500-1500

Division II: Early Modern Europe

1) Renaissance and Reformation, 1300-1648
2) Tudor and Stuart and Early Hanoverian England, 1485-1760
3) The Age of Enlightenment and Revolution, 1648-1815

Division III: Modern Europe

1) Western and Central Europe, 1815-1914
2) Europe since 1870
3) Eastern Europe since 1750
4) Imperial and Soviet Russia, 1700-to the Present
5) Modern England since 1760

Division IV: East Asia

1) Traditional East Asia to 1850

2) Modern East Asia after 1850

Division V: Latin America

1) Latin America to 1824

2) Latin America since 1824

Division VI: United States of America

1) United States to 1877

2) United States 1850 to the Present

With the consent of the departmental Graduate Committee, a student may define a field or fields not included in this above list (e.g., expansion of Europe). In a few cases, where advanced work outside the Department of History is an integral part of the student's preparation for a professional career (e.g., preparation in science for historians of science or in economics for economic historians), the Committee will consider a request to substitute such advanced work for one of the two minor fields.

6. COURSES ACCEPTABLE FOR GRADUATE CREDIT

Reading Seminar in Ancient History
Reading Seminar in Medieval History
Research Seminar in Medieval History

Research Seminar in East Asian History
Reading Seminar in East Asian History

American Colonial Society
Age of the American Revolution, 1760-1789
American Constitutional Origins
American Constitutional Development

The Age of Jefferson and Jackson
Civil War and Reconstruction
Social and Intellectual History of the U.S. to 1865
Social and Intellectual History of the U.S. Since 1865
Research Seminar in 19th Century America
Reading Seminar in 19th Century America

Recent U.S. History 1877-1929
Recent U.S. History 1929-1962
Research Seminar in Recent American History
Reading Seminar in Recent American History
History of American Industrial Society to 1900
History of American Industrial Society since 1900

Latin America and the Outside World
Modern Mexico
Research Seminar in Latin America since Independence
Reading Seminar in Latin America since Independence
Research Seminar in Colonial Latin America
Reading Seminar in Colonial Latin America

Social and Economic History of England, 1760-1865
Social and Economic History of England, 1865-Present
Intellectual History of Europe, 1815-1914
Research Seminar in Modern British History
Reading Seminar in Modern British History
Reading Seminar in Modern European Intellectual History

Political and Social History of Germany, 1806-1890
Political and Social History of Germany, 1890-Present
Research Seminar in 19th and 20th Century German History
Reading Seminar in 19th and 20th Century German History
Research Seminar in 19th and 20th Century Europe
Reading Seminar in 19th and 20th Century Europe

Imperial Russia
Soviet Russia

NOTE:

In 1966-67, the department plans to offer additional graduate courses, which will probably include:

a year course in the expansion of Europe
a year course in the history of the ancien regime and the French Revolutio
a year course in Tudor Stuart England

GRADUATE PROGRAM IN MATHEMATICS

Admission To Graduate Study

For admission to graduate study in mathematics, an applicant should have a baccalaureate degree with preparation substantially equivalent to that required of mathematics majors at this institution. He is required to present three letters of recommendation from members of the mathematics faculty under whom he has taken courses. The Departmental recommendation for admission will be based upon signs of exceptional ability in mathematics as indicated by these letters and the student's grades.

In certain cases a student whose background in mathematics contains gaps may be admitted on a provisional basis. Upon admission the student will be informed of the requirements which he must satisfy in order to be admitted to full standing.

Requirements For The M.A. Degree

Aside from the general requirements of the Graduate College, the single Departmental requirement is the successful completion of a comprehensive examination designed to test general proficiency in the fields of real and complex analysis, algebra, and some branch of geometry or topology. Syllabi and bibliographies indicating the nature and scope of the examination will be provided. Students will prepare for the examination in regularly organized courses and, with the occasional assistance of the staff, through independent study. Students who are admitted to full standing and are studying full time will normally take the examination after one calendar year of preparation.

The Ph.D. Program

The Department expects to inaugurate a Ph.D. program in the fall of 1965. Qualified students who have the permission of the Department will then be able to transfer from the M.A. to the Ph.D. program without loss of credit for residence.

COURSES

A. Advanced Undergraduate Courses

MAT 301 Introduction to Complex Analysis

Holomorphic functions. The Cauchy-Riemann equations, Cauchy's theorem, Taylor series. Maximum modulus theorem. Meromorphic functions. Laurent series, the Cauchy residue theorem.

Prerequisite: Advanced Calculus Fall, 3 credits

MAT 302 Introduction to Real Analysis

Functions of bounded variation. Lebesgue and Lebesgue-Stieltjes measures and integrals, and the corresponding theorems of Fubini and Radon-Nikodym. Basic properties of L_2.

Prerequisite: Advanced Calculus Spring, 3 credits

MAT 312 Introduction to Topology

Triangulated spaces and their simplicial homology. Singular homology, its properties and its relationship to simplicial theory. Fixed point theorems. The fundamental group and covering spaces.

Prerequisite: Advanced Calculus, Algebra I (Groups, rings and fields)

Fall, 3 credits

MAT 323 Introduction to Differential Geometry

Local theory of curves and surfaces in Euclidean space: fundamental forms, curvature, geodesics. Introduction to global differential geometry.

Prerequisite: Advanced Calculus Spring, 3 credits

MAT 331 Algebra II

Elementary group theory: composition series, the Sylow theorems, the fundamental theorem of Abelian groups. Galois theory.

Prerequisite: Algebra I Spring, 3 credits

B. Graduate Courses

MAT 401-402 Analysis I, II

Topological preliminaries - compactification, metrization, completion of metric spaces. The Baire category theorem. Abstract measures, their extension and decomposition. Integration. The Radon-Nikodym theorem. Product measures and the theorem of Fubini. Elementary theory of Banach and Hilbert spaces.

Prerequisite: *MAT 302 or permission of instructor

Fall, Spring: 4 credits each semester

MAT 406 Complex Analysis

Entire functions. Normal families and the Riemann Mapping Theorem. Picard's theorem. The Dirichlet problem, harmonic and subharmonic functions. Analytic continuation and the monodromy theorem, the Riemann surface of a function.

Prerequisite: MAT 301

Spring, 4 credits

MAT 409 Analysis Seminar

Topic for 1964-5: Introduction to differential topology.

Fall, Spring:
2 credits each semester

MAT 412 Algebraic Topology I

Homotopy groups. The Hurewics theorem. Obstruction theory. Fibre spaces. Spectral sequences.

Prerequisite: MAT 312

Spring, 4 credits

MAT 413 Algebraic Topology II

Cohomology operations. Application to the computation of the homotopy groups of spheres and other problems.

Fall, 4 credits
(not offered 1964-5)

MAT 417 Topology Seminar

Topic for 1964-5: K-Theory.

Fall, Spring:
2 credits each semester

*Prerequisites may also be satisfied by equivalent material taken at other universities or by independent study.

MAT 421 Differential Geometry

Differentiable manifolds and submanifolds, tensor bundles, theorems of Stokes, Frobenius and de Rham, connections and curvature.

Prerequisite: Advanced Calculus, and MAT 312 or permission of the instructor.

Fall, 4 credits

MAT 422 Riemannian Geometry

Linear connections, Riemannian manifolds and the Riemannian connection, geodesics, elements of Morse Theory for Riemannian spaces, relations between curvature and the topology of the space.

Prerequisite: MAT 421 Spring, 4 credits

MAT 427 Differential Geometry Seminar

Topic for 1964-5: Symmetric Spaces

Fall, Spring:
2 credits each semester

MAT 431-432 Algebraic Systems I, II

Structure of rings - chain conditions, theory of the radical. Modules over rings of various types. Structure of algebras. Cohomology of algebras.

Prerequisite: MAT 331

Fall, Spring:
4 credits each semester

MAT 437 Algebra Seminar

Among the topics for 1964-5 will be an introduction to homological algebra.

Fall, Spring:
4 credits each
semester (1964-5 only).

ESM 401 - Physical Chemistry of Engineering Materials I

This course provides an advanced survey of the basic physical and chemical principles underlying the behavior of engineering materials: principles of quantum theory, theory of atomic and simple molecular spectra, intermolecular forces, covalent bonding, principles of statistical mechanics, partition functions and their relationship to thermodynamics, theory of nonideal gases and liquids. Emphasis will be placed on the engineering applications of the theory.

ESM 402 - Physical Chemistry of Engineering Materials II

Extensions of the above to the theory of solutions of electrochemistry, homogeneous and heterogeneous equilibria, phase transformations, theory of transport phenomena, rate equations, chemical kinetics, surface phenomena and principles of nuclear structure and decay. Applications to metallurgy, materials processing and other branches of engineering will be emphasized.

ESM 410 - Phase Transformations

Thermodynamics of phase transformations, diffusion mechanisms, nucleation, mechanisms of phase transformation, solidification and melting, application to engineering materials.

ESM 411 - Dislocations and the Mechanical Properties of Matter

Stress-strain tensors, principles of elasticity and plasticity, advanced dislocation theory, deformation of single crystals, deformation of polycrystalline materials, applications to creep, fracture fatigue.

ESM 414 - Quantum Theory of Matter - I

A formal introduction to quantum mechanics covering such topics as linear operations, matrix representatives of operators, inverse operators and Green's Functions, perturbation theory, electron spin many electron systems, Hartree—Foch method, free electron approximations, band theory, Bloch functions, Brillouin Zones, Wigner-Seitz method, application to alloys, chemical bonding and other relevant areas.

ESM 415 - Quantum Theory of Matter - II

Lattice Vibrations in three dimensions, energy distribution of electrons, Boltzmann transport equation, electron motion in perfect three dimensional crystals, electron phonon interactions, magnetic properties, crystal field theory. Applications to thermoelectric devices, photoelectricity, stimulated emission amplifiers.

ESM 420 - Physics of Engineering Solids - I

This course will emphasize such topics as structure of solids symmetry principle, and elementary group theory, bonding in solids, x-ray diffraction theory, solid state thermodynamics, point defects, dislocations of grain boundary, elastic and plastic deformation, lattice vibrations and the thermal properties of solids.

ESM 421 - Physics of Engineering Solids - II

Quantum theory of solids, Brillouin Zones, theory of conductors insulators, phonon-electron interactions, magnetism. Applications to electronic devices, solid state energy converters, Lasers, magnetic devices.

ESM 430 - Polymer Theory and Technology

Polymer structure, polymerization mechanisms, determination of molecular weight, viscosity, light scattering, technology of manufacturing and fabricating high polymers.

ESM 440 - Advanced Techniques of Materials Research I

Theory and laboratory demonstrations of high vacuum techniques, high temperature techniques, cryogenic procedures, single crystal and zone refining techniques.

ESM 441 - Advanced Techniques of Materials Research II

Theory and demonstrations of spectroscopic methods, electron and x-ray diffraction.

In addition to the courses listed above, it is expected that the following graduate courses will be offered in the near future:

Chemical Transformations I
Chemical Transformations II
Statistical Theory of Matter I
Statistical Theory of Matter II
Topics in Materials Research
Principles of Industrial Chemistry I
Principles of Industrial Chemistry II
Nuclear Theory and Technology
Magnetic Materials
Materials and Techniques of Modern Energy Conversion
Advanced Analysis