Swarthmore

COLLEGE BULLETIN, 1985-86

CATALOGUE

The person who sees liberal arts education as practical looks toward a far broader horizon.

In an era of accelerating change, today's technical mastery is tomorrow's obsolescence. CONTINUED INSIDE COVER

Swarthmore

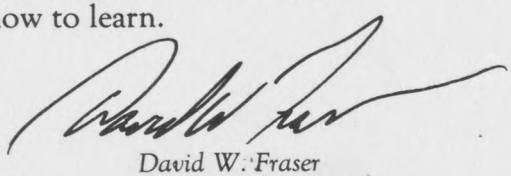
College Bulletin 1985-1986

Volume LXXXIII Number 1

Catalogue Issue September 1985

Continued from front cover

We have the choice of preparing our students for the next three to five years through technical training, or for a lifetime by teaching them how to face new situations, ask new questions, and adapt again and again to a world of dizzying change. We used to say: Give a man a fish and you feed him for a day; teach him how to fish and you feed him for a lifetime. But liberal arts education goes beyond that, to teach him (and her) how to learn.



David W. Fraser
President

Directions for Correspondence

SWARTHMORE COLLEGE, SWARTHMORE, PA 19081

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College Calendar

1985 Fall Semester

August 28	Dormitories open for new students
August 30	Dormitories open for returning students
August 28–September 1	Freshman placement days
August 30	Meeting of Honors students
August 31	Registration
September 2	Classes and Seminars begin
October 11	October Holiday begins, end of last class or seminar
October 21	October Holiday ends, 8:30 a.m.
November 27	Thanksgiving vacation begins, end of last class or seminar
December 2	Thanksgiving vacation ends, 8:30 a.m.
December 6	Enrollment for spring semester
December 10	Classes end
December 11	Meeting of Honors students
December 13	Seminars end
December 16	Midyear examinations begin
December 21	Midyear examinations end

1986 Spring Semester

January 19	Dormitories open 9:00 a.m.
January 20	Classes and Seminars begin
March 7	Spring vacation begins, 6:00 p.m.
March 8	Dormitories close 9:00 a.m.
March 16	Dormitories open 9:00 a.m.
March 17	Spring vacation ends, 8:30 a.m.
April 18–20	Parents Weekend
April 28–May 2	Reading period (at option of instructor)
May 2	Classes and Seminars end
May 5	Enrollment for fall semester
May 8	Written Honors examinations begin
May 8	Course examinations begin
May 17	Course examinations end
May 19	Written Honors examinations end
May 20, 21	Senior comprehensive examinations
May 22–24	Oral Honors examinations
June 1	Baccalaureate Day
June 2	Commencement Day
June 6, 7, 8	Alumni Weekend

College Calendar

(Tentative)

1986 Fall Semester

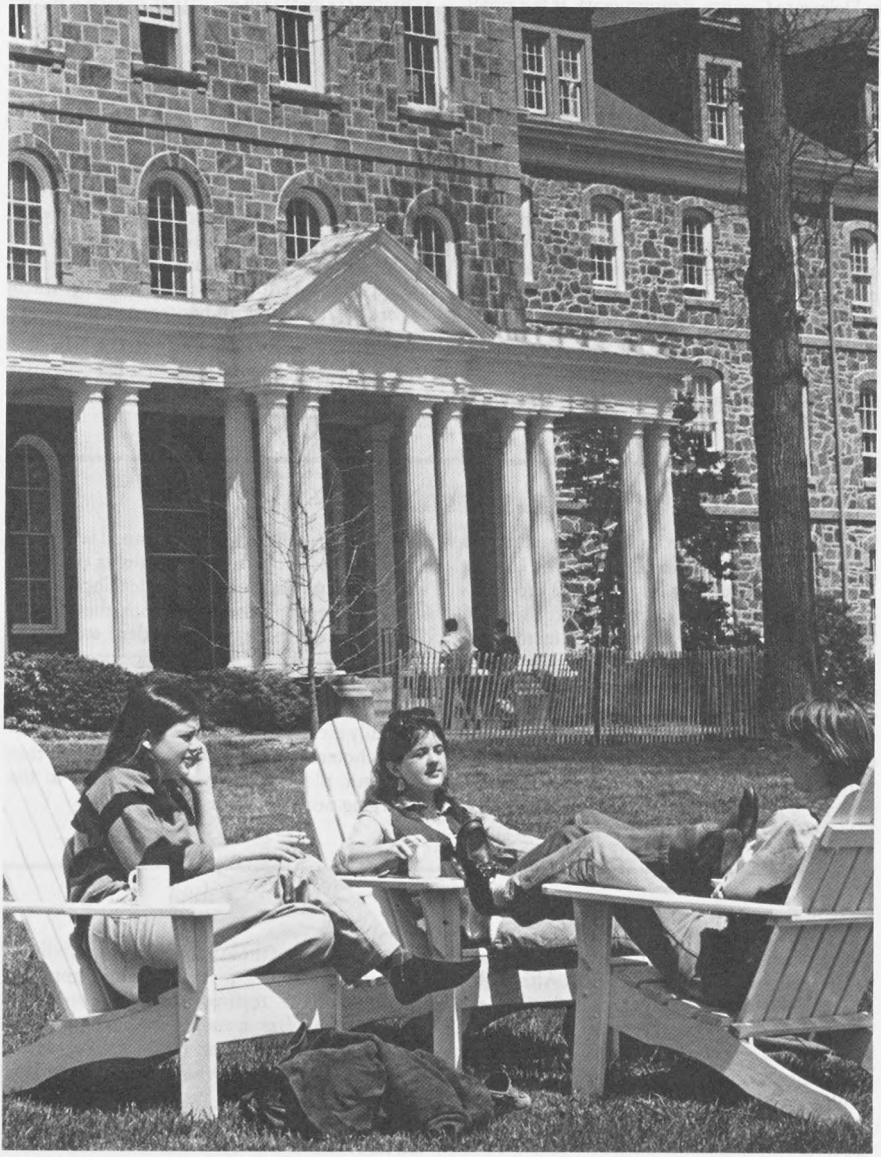
August 27	Dormitories open for new students
August 29	Dormitories open for returning students
August 27–31	Freshman placement days
August 29	Meeting of Honors students
August 30	Registration
September 1	Classes and Seminars begin
October 10	October Holiday begins, end of last class or seminar
October 20	October Holiday ends, 8:30 a.m.
November 26	Thanksgiving vacation begins, end of last class or seminar
December 1	Thanksgiving vacation ends, 8:30 a.m.
December 5	Enrollment for spring semester
December 9	Classes end
December 10	Meeting of Honors students
December 12	Seminars end
December 15	Midyear examinations begin
December 20	Midyear examinations end

1987 Spring Semester

January 18	Dormitories open 9:00 a.m.
January 19	Classes and Seminars begin
March 6	Spring vacation begins, 6:00 p.m.
March 7	Dormitories close 9:00 a.m.
March 15	Dormitories open 9:00 a.m.
March 16	Spring vacation ends, 8:30 a.m.
April 27–May 1	Reading period (at option of instructor)
May 1	Classes and Seminars end
May 4	Enrollment for fall semester
May 7	Written Honors examinations begin
May 7	Course examinations begin
May 16	Course examinations end
May 18	Written Honors examinations end
May 19, 20	Senior comprehensive examinations
May 21–23	Oral Honors examinations
May 31	Baccalaureate Day
June 1	Commencement Day
June 5, 6, 7	Alumni Weekend

Introduction to Swarthmore College

Educational Resources



Introduction to Swarthmore College

Swarthmore College, founded in 1864 by members of the Religious Society of Friends as a coeducational institution, occupies a campus of more than 300 acres of rolling wooded land in and adjacent to the borough of Swarthmore in Delaware County, Pennsylvania. It is a small college by deliberate policy. Its present enrollment is about 1,300 men and women students. The borough of Swarthmore is a residential suburb within half an hour's commuting distance of Philadelphia. College students are able to enjoy both the advantages of a semi-rural setting and the opportunities offered by Philadelphia. The College's location also makes possible cooperation with three nearby institutions, Bryn Mawr and Haverford Colleges and the University of Pennsylvania.

OBJECTIVES AND PURPOSES

Swarthmore students are expected to prepare themselves for full, balanced lives as individuals and as responsible citizens through exacting intellectual study supplemented by a varied program of sports and other extra-curricular activities.

The purpose of Swarthmore College is to make its students more valuable human beings and more useful members of society. While it shares this purpose with other educational institutions, each school, college, and university seeks to realize that purpose in its own way. Each must select those tasks it can do best. By such selection it contributes to the diversity and richness of educational opportunity which is part of the American heritage.

Swarthmore seeks to help its students realize their fullest intellectual and personal potential combined with a deep sense of ethical and social concern.

VARIETIES OF EDUCATIONAL EXPERIENCE

Education is largely an individual matter, for no two students are exactly alike. The Course and External Examination (Honors) Programs are designed to give recognition to this fact. They provide alternative systems of instruction for students during their last two years. Both seek to evoke the maximum effort and development from each student, the choice of method being determined by individual preference and capacity. The Honors Program, in which Swarthmore pioneered, provides an enriching and exciting intellectual experience. It has as its main ingredients close association with faculty members, often in small seminars, concentrated work in various fields of study, and maximum latitude for the development of individual responsibility. Within the Course Program, options for independent study and interdisciplinary work offer opportunities for exploration and development over a wide range of individual goals. These opportunities typically include considerable flexibility of program choices from semester to semester, so that academic planning may be responsive to the emerging needs of students.

THE RELIGIOUS TRADITION

Swarthmore College was founded by members of the Religious Society of Friends. Although it has been nonsectarian in control since the beginning of the present century, and although Friends now compose a minority of the student body, the faculty, and the administration, the College seeks to illuminate the lives of its students with the spiritual principles of that Society.

Foremost among these principles is the individual's responsibility for seeking and applying truth, and for testing whatever truth one believes one has found. As a way of life, Quakerism emphasizes hard work, simple living, and generous giving; personal integrity, social justice, and the peaceful settlement of disputes. The College does not seek to impose on its students this Quaker view of life, or any

other specific set of convictions about the nature of things and the duties of human beings. It does, however, encourage ethical and religious concern about such matters, and continuing examination of any view which may be held regarding them.

TRADITION AND CHANGE

A college draws strength from tradition, and energy from the necessity of change. Its purposes and policies must respond to new conditions and new demands. By being open to change, Swarthmore tries to provide for its students, by means appropriate to the times, the standard of excellence it has sought to maintain from its founding.

Educational Resources

The primary educational resources of any college are the quality of its faculty and the spirit of the institution. Financial as well as physical resources play an important supportive role.

THE ENDOWMENT

The educational resources at Swarthmore College have been provided by gifts and bequests from many alumni, foundations, corporations, parents and friends. In addition to unrestricted gifts for the operating budget, these donors have contributed funds for buildings, equipment, collections of art and literature, and permanently endowed professorships, scholarships, awards, book funds and lectureships. Their gifts to Swarthmore have not only provided the physical plant, but also have created an endowment fund of approximately $165,000,000 at market value on June 30, 1985. Income from the endowment during the academic year 1984-85 contributed approximately $5,200 to meet the total expense of educating each student and accounted for almost 23% of the College's educational and general income.

The College's ability to continue to offer a high quality of education at a reasonable level of tuition depends on continuing voluntary support. Swarthmore seeks additional gifts and bequests for its current operations, its permanent endowment, and its capital development programs to maintain and strengthen its resources. The Vice President in charge of development will be pleased to provide information about various forms of gifts: bequests, outright gifts of cash or securities, real estate or other property, and deferred gifts through charitable remainder trusts and life income contracts in which the donor reserves the right to the annual income during his or her lifetime.

LIBRARIES

The College Library is an active participant in the instructional and research program of the College. It seeks to instruct students in the effective and efficient use of the library, and to encourage them to develop the habit of self-education so that books and libraries may contribute to their intellectual development in future years. To this end the Library acquires and organizes books, journals, audivisuals, and other library materials for the use of students and faculty. While the Library's collections are geared primarily towards undergraduate instruction, the demands of student and faculty research make necessary the provision of source material in quantity not usually found in undergraduate libraries. Further needs are met through interlibrary loan or other cooperative arrangements. The *Thomas B. and Jeanette E. L. McCabe Library*, situated on the front campus, is the center of the College Library system housing reading and seminar rooms, administrative offices, and the major portion of the College Library collections.

Total College Library holdings amount to 600,000 volumes with some 20,000 volumes added annually. About 2,700 periodical titles are received regularly. *The Cornell Library of Science and Engineering* (completed in 1982) houses some 54,000 volumes. *The Daniel Underhill Music Library* contains around 14,000 books and scores, 10,000 recordings and listening equipment. Small collections of relevant material are located in Sproul Observatory and in the Black Cultural Center.

Special Library Collections

The Library contains certain special collections: *British Americana*, accounts of British travellers in the United States; the works of the English poets Wordsworth and Thomson bequeathed to the Library by *Edwin H. Wells*; the *W. H. Auden Collection* commemorating the English poet who taught at Swarthmore in the mid-forties; the *Bathe Collection* of the history of technology donated by Greville Bathe; the *Private Press Collection* representing

the work of over 600 presses. The *Audiovisual Collection* has a variety of recordings on disc, tape, and videotape. It includes contemporary writers reading from and discussing their works; full length versions of Shakespearean plays (both videocassettes and discs) and other dramatic literature; the literature of earlier periods read both in modern English and in the pronunciation of the time; recordings of literary programs held at Swarthmore, and videocassettes of U.S. and foreign film classics. These materials are used as adjuncts to the study of literature, art, and history and are housed in the McCabe Library. Their acquisition is partially funded with income from the *William Plummer Potter Public Speaking Fund* (1950) and the *Betty Dougherty Spock '52 Memorial Fund.*

Within the McCabe Library building are two special libraries which enrich the academic background of the College:

The Friends Historical Library, founded in 1871 by Anson Lapham, is one of the outstanding collections in the United States of manuscripts, books, pamphlets, and pictures relating to the history of the Society of Friends. The library is a depository for records of Friends Meetings belonging to Baltimore, Philadelphia, and other Yearly Meetings. More than 3,200 record books, dating from the 1680's until the present, have been deposited. Additional records are available on microfilm. The William Wade Hinshaw Index to Quaker Meeting Records lists material of genealogical interest. Special collections include materials of various subjects of Quaker concern such as abolition, Indian rights, utopian reform, and the history of women's rights. Notable among the other holdings are the Whittier Collection (first editions and manuscripts of John Greenleaf Whittier, the Quaker poet), the Mott manuscripts (over 400 autographed letters of Lucretia Mott, antislavery and women's rights leader), and the Hicks manuscripts (more than 300 letters of Elias Hicks, a prominent Quaker minister). The library's collection of books and pamphlets by and about Friends numbers approximately 35,000 volumes. About 200 Quaker periodicals are currently received. There is also an extensive collection of photographs of meetinghouses and pictures of representative Friends, as well as a number of oil paintings, including two versions of "The Peaceable Kingdom" by Edward Hicks. It is hoped that Friends and others will consider the advantages of giving to this library any books and family papers which may throw light on the history of the Society of Friends.

The Swarthmore College Peace Collection is of special interest to research students seeking the records of the peace movement. The personal papers of Jane Addams of Hull-House, Chicago formed the original nucleus of the Collection (1930). Over the years other major collections have been added including the papers of Devere Allen, Emily Greene Balch, Julien Cornell, Homer Jack, Lucy Biddle Lewis, A.J. Muste, Lawrence Scott, John Nevin Sayre, William Sollmann, E. Raymond Wilson, and others, as well as the records of the American Peace Society, A Quaker Action Group, Business Executives Move, CCCO, Fellowship of Reconciliation, Friends Committee on National Legislation, Lake Mohonk Conferences on International Arbitration, National Interreligious Service Board for Conscientious Objectors, National Council for Prevention of War, National Council to Repeal the Draft, SANE, War Resisters League, Women's International League for Peace and Freedom, Women Strike for Peace, World Conference of Religion for Peace, and many others. The Peace Collection serves as the official repository for the archives of many of these organizations, incorporated here in 7,000 document boxes. The Collection also houses over 12,000 books and pamphlets and about 2,000 periodical titles. Two hundred eighty periodicals are currently received from 22 countries. The comprehensive *Guide to the Swarthmore College Peace Collection*, published in 1981, fully describes the archival holdings.

PHYSICAL FACILITIES

Laboratories, well-equipped for undergraduate instruction and in most cases for research, exist in physics, chemistry, zoology, botany, psychology, astronomy, and engineering. The

Educational Resources

Sproul Observatory, with its 24-inch visual refracting telescope, is the center of much fundamental research in multiple star systems. The Edward Martin Biological Laboratory provides facilities for work in zoology, botany, and premedical studies. The Pierre S. Du Pont Science Building provides accommodations for chemistry, mathematics, and physics. Hicks Hall contains the engineering laboratories, including a computer laboratory equipped with a DEC PDP 11/40 system with disc storage and laboratory peripherals. Papazian Hall provides facilities for work in psychology, and for the engineering shops.

Pearson Hall contains the Paul M. Pearson Experimental Theatre and studios for various arts and crafts.

The Florence Wilcox Gallery for art exhibitions is located in Room 303 on the third floor of Beardsley Hall.

The Eugene M. and Theresa Lang Music Building, opened in 1973, contains an auditorium seating approximately 500, the Daniel Underhill Music Library, classrooms, practice and rehearsal rooms, and an exhibition area. It is the central facility for the program of the Music Department and for musical activities at the College.

The Computing Center is located on the first floor of Beardsley Hall. A PR1ME 9950 with twelve megabytes of main memory and 1,600 megabytes of on-line disk storage is available to students and faculty for instruction and research. Many computer languages such as APL, BASIC, FORTRAN, and Pascal are available, as well as graphics, statistical, and simulation packages and instructional programs for various academic disciplines. Microcomputer and terminal clusters are maintained in Beardsley, Du Pont, Martin, and Trotter Halls, and also McCabe and Cornell Libraries. Terminals may also be found in virtually all academic departments. Some departments also have microcomputers, and the Engineering Department has a DEC PDP 11/40 and three APOLLO graphics workstations. A PR1ME Information 750 and a PR1ME 2250 are used for the College's administrative data processing In addition, through EDUNET, an international computer network, faculty and students have access to computing facilities at a number of major research institutions such as Stanford and MIT for special projects and research.

The Center for Social and Policy Studies in Trotter Hall serves as a laboratory for the social sciences. The Center has a social science data archive available for empirical research on social and policy issues, and it provides statistical consulting for faculty and students. The Center also supports the concentration in Public Policy through its physical facilities, data archives and program of events.

The Language Laboratory in Martin Hall was newly installed in 1982. It provides stations for 27 students and has equipment for both audio and video instruction.

SPECIAL FUNDS AND LECTURESHIPS

The William J. Cooper Foundation provides a varied program of lectures and concerts which enriches the academic work of the College. The Foundation was established by William J. Cooper, a devoted friend of the College, whose wife, Emma McIlvain Cooper, served as a member of the Board of Managers from 1882 to 1923. Mr. Cooper bequeathed to the College the sum of $100,000 and provided that the income should be used "in bringing to the college from time to time eminent citizens of this and other countries who are leaders in statesmanship, education, the arts, sciences, learned professions and business, in order that the faculty, students and the college community may be broadened by a closer acquaintance with matters of world interest." Admission to all programs is without charge.

The Cooper Foundation Committee works with the departments and with student organizations in arranging single lectures and concerts, and also in bringing to the College speakers of note who remain in residence for a long enough period to enter into the life of the community. Some of these speakers have been invited with the understanding that their lectures should be published under the auspices of the Foundation. This arrangement has so far produced eighteen volumes.

The Arthur Hoyt Scott Horticultural Foundation. About three hundred twenty-five acres are contained in the College property, including a large tract of woodland and the valley of Crum Creek. Much of this tract has been developed as a horticultural and botanical collection of trees, shrubs, and herbaceous plants through the provisions of the Arthur Hoyt Scott Horticultural Foundation, established in 1929 by Mrs. Arthur Hoyt Scott and Owen and Margaret Moon as a memorial to Arthur Hoyt Scott of the Class of 1895. The plant collections are designed both to afford examples of the better kinds of trees and shrubs which are hardy in the climate of Eastern Pennsylvania and suitable for planting by the average gardener, and to beautify the campus. All collections are labeled and recorded. There are exceptionally fine displays of hollies, Japanese cherries, flowering crab apples, magnolias, and tree peonies, and a great variety of lilacs, rhododendrons, azaleas, and daffodils. Many interested donors have contributed generously to the collections.

The Foundation conducts applied research on ornamental plants, and serves as a test site for two plant evaluation programs: the Styer Award of Garden Merit through the Pennsylvania Horticultural Society and the Plant Introduction scheme of the University of British Columbia Botanic Garden.

The Foundation offers horticultural educational programs to the general public and an extracurricular course in horticulture to Swarthmore students. These workshops, lectures, and classes are designed to cover many facets of the science/art called gardening. Tours are conducted throughout the year for college people and interested public groups.

Aiding the Foundation's staff, in all of its efforts, are the "Associates of the Scott Horticultural Foundation." This organization provides not only financial support but also assistance in carrying out the myriad operations which make up the Foundation's total program, such as plant propagation, public lectures, and bus tours to other gardens. The Associates' newsletter, *Hybrid,* serves to publicize their activities and provides up-to-date information on seasonal gardening topics.

The Barnard Fund was established in 1964 by two graduates of the College, Mr. and Mrs. Boyd T. Barnard of Rosemont, Pennsylvania. The fund has been augmented by the 50-year class gifts from the classes of 1917 and 1919, and other friends. The income from the fund may be used for any activity that contributes to the advancement of music at the College. It has been used, for example, for concerts on the campus, for the purchase of vocal and orchestral scores and other musical literature, and to provide scholarships for students in the Department of Music who show unusual promise as instrumentalists or vocalists.

The Gene D. Overstreet Memorial Fund, given by friends in memory of Gene D. Overstreet (1924-1965), a member of the Political Science Department, 1957-1964, provides income to bring a visiting expert to the campus to discuss problems of developing or modernizing nations and cultures.

The Benjamin West Lecture, made possible by gifts from members of the class of 1905 and other friends of the College, is given annually on some phase of art. It is the outgrowth of the Benjamin West Society which built up a collection of paintings, drawings, and prints, which are exhibited, as space permits, in the college buildings. The lecture owes its name to the American artist, who was born in a house which stands on the campus and who became president of the Royal Academy.

The Swarthmore Chapter of Sigma Xi lecture series brings eminent scientists to the campus under its auspices throughout the year. Local members present colloquia on their own research.

The Lee Frank Memorial Art Fund, endowed by the family and friends of Lee Frank, Class of 1921, sponsors each year a special event in the Art Department: a visiting lecturer or artist, a scholar or artist in residence, or a special exhibit.

The Marjorie Heilman Visiting Artist Fund was established by M. Grant Heilman, Class of 1941, in memory of Marjorie Heilman to stimulate interest in art, particularly the practice of art, on campus.

The Suzanne Belkin Memorial Reading, established by her family in memory of Suzanne Belkin, Class of 1978, makes possible an annual appearance on campus of a distinguished writer.

Endowed Professorships

The Edmund Allen Professorship of Chemistry was established in 1938 by a trust set up by his daughter Laura Allen, friend of the college and cousin of Manager Rachel Hillborn.

The Albert L. and Edna Pownall Buffington Professorship was established by a bequest from Albert Buffington, Class of 1896, in 1964, in honor of his wife, Edna Pownall Buffington, Class of 1898.

Centennial Chairs. Three professorships, unrestricted as to field, were created in 1964 in honor of Swarthmore's Centennial from funds raised during the Centennial Fund Campaign.

The Isaac H. Clothier Professorship of History and International Relations was created in 1888 by Isaac H. Clothier, member of the Board of Managers. Originally in the field of Civil and Mechanical Engineering, he later approved its being a chair in Latin, and in 1912 he approved its present designation.

The Isaac H. Clothier, Jr., Professorship of Biology was established by Isaac H. Clothier, Jr. as a tribute of gratitude and esteem for Dr. Spencer Trotter, Professor of Biology, 1888-1926.

The Morris L. Clothier Professorship of Physics was established by Morris L. Clothier, Class of 1890, in 1905.

The Julien and Virginia Cornell Visiting Professorship was endowed by Julien Cornell '30, member, and Virginia Stratton Cornell '30, former member of the Board of Managers, to bring professors and lecturers from other nations and cultures for a semester or a year. Since 1962, from every corner of the world, Cornell professors and their families have resided on the campus so that they might deepen the perspective of both students and faculty.

The Alexander Griswold Cummins Professorship of English Literature was established in 1911 in honor of Alexander Griswold Cummins, Class of 1889, by Morris L. Clothier, Class of 1890.

The Howard N. and Ada J. Eavenson Professorship in Engineering was established in 1959 by a trust bequest of Mrs. Eavenson, whose husband graduated in 1895.

The Howard M. and Charles F. Jenkins Professorship of Quaker History and Research was endowed in 1924 by Charles F. Jenkins, Hon. '26 and member of the Board of Managers, on behalf of the family of Howard M. Jenkins, member of the Board of Managers, to increase the usefulness of the Friends Historical Library and to stimulate interest in American and Colonial history with special reference to Pennsylvania. The fund was added to over the years through the efforts of the Jenkins family, and by a 1976 bequest from C. Marshall Taylor '04.

The William R. Kenan, Jr. Professorship was established in 1973 by a grant from the William R. Kenan, Jr. Charitable Trust to "support and encourage a scholar-teacher whose enthusiasm for learning, commitment to teaching and sincere personal interest in students will enhance the learning process and make an effective contribution to the undergraduate community."

The Eugene M. Lang Research Professorship, established in 1981 by Eugene M. Lang '38, member of the Board of Managers, normally rotates every four years among members of the Swarthmore faculty and includes one year devoted entirely to research, study, enrichment or writing. It carries an annual discretionary grant for research expenses, books and materials.

The Eugene M. Lang Visiting Professorship, endowed in 1981 by Eugene M. Lang '38, brings to Swarthmore College for a period of one semester to three years an outstanding social scientist or other suitably qualified person who has achieved prominence and special recognition in the area of significant social change.

The Susan W. Lippincott Professorship of French was endowed in 1911 through a bequest from Susan W. Lippincott, member of the Board of Managers, a contribution from her niece Caroline Lippincott, Class of 1881, and gifts by other family members.

The Edward Hicks Magill Professorship of Mathematics and Astronomy was created in 1888 largely by contributions of interested friends of Edward H. Magill, President of the College

1872-1889, and a bequest from John M. George.

The Charles and Harriet Cox McDowell Professorship of Philosophy and Religion was established in 1952 by Harriet Cox McDowell, Class of 1887 and member of the Board of Managers, in her name and that of her husband, Dr. Charles McDowell, Class of 1877.

The Richter Professorship of Political Science was established in 1962 by a bequest from Max Richter at the suggestion of his friend and attorney, Charles Segal, father of Robert L. Segal '46 and Andrew Segal '50.

The Henry C. and J. Archer Turner Professorship of Engineering was established with their contributions and gifts from members of the Turner family in 1946 in recognition of the devoted service and wise counsel of Henry C. Turner, Class of 1893 and member of the Board of Managers, and his brother J. Archer Turner, Class of 1905 and member of the Board of Managers.

The Daniel Underhill Professorship of Music was established in 1976 by a bequest from Bertha Underhill to honor her husband, Class of 1894 and member of the Board of Managers.

The Joseph Wharton Professorship of Political Economy was endowed by a trust given to the College in 1888 by Joseph Wharton, President of the Board of Managers.

The Isaiah V. Williamson Professorship of Civil and Mechanical Engineering was endowed in 1888 by a gift from Isaiah V. Williamson.

II

Admission
Expenses

Financial Aid

Admission

Inquiries concerning admission and applications should be addressed to the Dean of Admissions, Swarthmore College, Swarthmore, Pennsylvania 19081.

GENERAL STATEMENT

In the selection of students, the College seeks those qualities of character, social responsibility, and intellectual capacity which it is primarily concerned to develop. It seeks them, not in isolation, but as essential elements in the whole personality of candidates for admission.

Selection is important and difficult. No simple formula will be effective. The task is to choose those who give promise of distinction in the quality of their personal lives, in service to the community, or in leadership in their chosen fields. Swarthmore College must choose its students on the basis of their individual future worth to society and of their collective realization of the purpose of the College.

It is the policy of the College to have the student body represent not only different parts of the United States but many foreign countries, both public and private secondary schools, and various economic, social, religious, and racial groups. The College is also concerned to include in each class sons and daughters of alumni and of members of the Society of Friends.

Admission to the freshman class is normally based upon the satisfactory completion of a four-year secondary school program. Under some circumstances, students who have virtually completed the normal four-year program in three years will be considered for admission, provided they meet the competition of other candidates in general maturity as well as readiness for a rigorous academic program.

All applicants are selected on the following evidence:

1. Record in secondary school.
2. Recommendations from the school principal, headmaster, or guidance counselor, and from two teachers.
3. Scores in the Scholastic Aptitude Test and in three Achievement Tests of the College Entrance Examination Board.
4. A brief essay (subject specified).
5. Reading and experience, both in school and out.

Applicants must have satisfactory standing in school, in aptitude and achievement tests, and strong intellectual interests. Other factors of interest to the College include strength of character, promise of growth, initiative, seriousness of purpose, distinction in personal and extra-curricular interests, and a sense of social responsibility. The College values the diversity which varied interests and backgrounds can bring to the community.

PREPARATION

Swarthmore does not require a set plan of secondary school courses as preparation for its program. The election of specific subjects is left to the student and school advisers. In general, however, preparation should include:

1. Accurate and effective use of the English language in reading, writing, and speaking.
2. Comprehension and application of the principles of mathematics.
3. The strongest possible command of one or two foreign languages. The College encourages students to study at least one language for four years, if possible.
4. Substantial course work in (a) history and social studies, (b) literature, art, and music, (c) the sciences. Variations of choice and emphasis are acceptable although some work in each of the three groups is recommended.

Those planning to major in engineering should present work in chemistry, physics, and four years of mathematics including algebra, geometry, and trigonometry.

APPLICATIONS AND EXAMINATIONS

Application to the College may be submitted through one of three plans: Regular Admission, Fall Early Decision, or Winter Early Decision. Applicants follow the same procedures, submit the same supporting materials, and are evaluated by the same criteria under each plan.

The *Regular Admission* plan is designed for those candidates who wish to keep open several different options for their undergraduate education throughout the admissions process. Applications under this plan will be accepted at any time up to the February 1 deadline.

The two *Early Decision* plans are designed for candidates who have thoroughly and thoughtfully investigated Swarthmore and other colleges and found Swarthmore to be an unequivocal first choice. The Winter Early Decision plan differs from the Fall Early Decision plan only in recognizing that some candidates may arrive at a final choice of college later than others. Early Decision candidates under either plan may file regular applications at other colleges with the understanding that these applications will be withdrawn upon admission to Swarthmore; however, one benefit of the Early Decision plans is the reduction of cost, effort, and anxiety inherent in multiple application procedures.

Application under any of the three plans must be accompanied by a non-refundable application fee of $30. Timetables for the three plans are:

Fall Early Decision

Closing date for applications	November 15
Final date for all supporting materials	November 30
Notification of candidate	on or before December 15

Winter Early Decision

Closing date for applications	January 1
Final date for all supporting materials	January 15
Notification of candidate	on or before February 1

Regular Admission

Closing date for applications	February 1
Final date for all supporting materials	February 15
Notification of candidate	on or before April 15
Candidates reply date	May 1

Any Early Decision candidate not accepted through either the Fall or Winter will be reconsidered without prejudice among the Regular Admission candidates.

All applicants for first-year admission must take the Scholastic Aptitude Test and three Achievement Tests given by the College Entrance Examination Board. English Composition is required, and the other two Achievement Tests should be selected from two different fields. Applicants for Engineering must take one Achievement Test in Mathematics.

Application to take these tests should be made directly to the College Entrance Examination Board, Box 592, Princeton, New Jersey 08540. A bulletin of information may be obtained without charge from the Board. Students who wish to be examined in any of the following western states, provinces, and Pacific areas — Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming, Alberta, British Columbia, Manitoba, Saskatchewan, Mexico, Australia, and all Pacific Islands including Formosa and Japan — should address their inquiries and send their applications to the College Entrance Examination Board, Box 1025, Berkeley, California 94701. Application should be made to the Board at least a month before the date on which the test will be taken.

No additional tests are required of candidates for scholarships. All applicants who would like to be considered for any of our scholarships should complete their applications at the earliest possible date. Information concerning financial aid will be found on pages 21-31.

THE INTERVIEW

An admissions interview with a representative of the College is a recommended part of the application process. Applicants should take the initiative in arranging for this interview. Those who can reach Swarthmore with no more than a half day's trip are urged to make an appointment to visit the College for this purpose.* Other applicants should request a meeting with an alumni representative in their own area. Interviews with alumni representatives take longer to arrange than interviews on campus. Applicants must make alumni interview arrangements well in advance of the final dates for receipt of supporting materials.

Arrangements for on-campus or alumni interviews can be made by writing the Office of Admissions or calling 215-447-7300.

ADVANCED PLACEMENT

Freshmen may apply for advanced standing or placement in particular courses if they have taken college level courses and the Advanced Placement Tests of the College Entrance Examination Board. Decisions are made by the departments concerned. Every effort is made to place students in the most advanced courses for which they are qualified.

Those freshmen who wish to have courses taken at another college considered for either advanced placement or credit must provide an official transcript from the institution attended as well as written work (papers, examinations), syllabi, and reading lists in order that the course work may be evaluated by the department concerned. Such requests for credit must be made within the freshman year at Swarthmore.

APPLICATIONS FOR TRANSFER

The College welcomes well qualified transfer students. Applicants for transfer must have had a good academic record in the institution attended and must present full credentials for both college and preparatory work, including a statement of honorable dismissal. They must take the Scholastic Aptitude Test given by the College Entrance Examination Board if this test has not been taken previously.

Four semesters of study at Swarthmore College constitute the minimum requirement for a degree, two of which must be those of the senior year. Applications for transfer must be filed by April 15 of the year in which entrance is desired. Decisions on these applications are announced by June 1. Application for transfer at mid-year must be received by November 15. Financial assistance is available for transfer students.

See page 36 for information on withdrawal and readmission for health reasons.

* Directions for reaching the College can be found inside the back cover of this catalogue.

Expenses

STUDENT CHARGES

Total charges for the 1985-86 academic year (two semesters) are as follows:

Tuition	$10,080
Room	1,940
Board	1,940
Student Activities Fee	140
	$14,100

These are the only charges billed by the College. Students and their parents, however, should plan for expenditures associated with books, travel, and other personal items.

Students engaged in independent projects away from the College for which regular academic credit is anticipated are expected to register in advance in the usual way and pay normal tuition. If the student is away from the College for a full semester, no charge for room and board will be made; but, if a student is away only for a part of a semester the above charges may be made on a pro rata basis.

The regular College tuition covers the normal program of four courses per term as well as variations of as many as five courses or as few as three courses. Students who elect to carry more than five courses incur a unit charge for the additional course ($1,260) or half course ($630), although they may within the regular tuition, vary their programs to average as many as five courses in the two semesters of any academic year. College policy does not permit programs of fewer than three courses for degree candidates in their first eight semesters of enrollment.

PAYMENT POLICY

A deposit of $100, due before enrollment for each semester, is required of all new and continuing students. This is credited against the College bill. Semester bills are mailed on July 15 and December 16. Payment for the first semester is due by August 12 and for the second semester by January 13. A late fee may be assessed on payments received after the due date.

Many parents have indicated a preference to pay college charges on a monthly basis rather than in two installments. For this reason, Swarthmore offers the AMS Budget Plan, which provides for payment in installments without interest charges. Information on the AMS Budget Plan is mailed to all parents in April.

WITHDRAWAL POLICY

Total charges will be reduced for students who, for reasons approved by the Dean, withdraw on or after the first day of classes.

Tuition, fees, and room charges will be reduced as follows:

Prior to the 2nd week of classes	80%
Prior to the 3rd week of classes	60%
Prior to the 4th week of classes	40%
Prior to the 5th week of classes	20%
None thereafter.	

Board charges will be reduced by $50 for each week the student is absent from the dining room.

No refund of the $100 deposit is made in the event of withdrawal.

INQUIRIES

All correspondence regarding payment of student charges should be addressed to: Margaret A. Thompson, Bursar.

Financial Aid

The College strives to make it possible for all students who are admitted to attend Swarthmore, regardless of their financial circumstances, and to enable them to complete their education when financial reversals take place. Forty-seven percent of the total student body currently receive aid from the College. Most financial aid awarded by the College is based upon demonstrated financial need and is usually a combination of grant, loan, and student employment.

A prospective student must apply for College as well as outside assistance at the time of application for admission: admission and financial aid decisions are, however, made separately. Instructions for obtaining and filing a Financial Aid Form, the required aid application, with the College Scholarship Service are included on the admissions application. Financial assistance will be offered if family resources are not sufficient to meet College costs. The amount a family is expected to contribute is determined by weighing the family's income and assets against such demands as taxes, living expenses, medical expenses, and siblings' tuition expenses. It also includes the expectation of $900-$1,000 from the student's summer earnings as well as a portion of his or her personal savings and assets.

For 1985-86 the College bill, which includes tuition, room and board, a comprehensive fee and the health insurance fee, will be $14,100. This comprehensive fee covers not only the usual student services — health, library, laboratory fees, for example — but admission to all social, cultural, and athletic events on campus. The total budget figure against which aid is computed is $15,100. This allows $1,000 for books and personal expenses. A travel allowance is added to the budget for those who live beyond 100 miles from the College.

An admitted student seeking aid must submit to the Finanical Aid Office a photocopy of the parents' most recent federal income tax return. When a student receives financial aid from a source other than the College, the student's need for our support is decreased, and so the College subtracts the amount of that financial aid from the Swarthmore award. This equitable distribution of total available resources enables the College to assist additional students. Thus, the amount of financial aid a student may expect to receive from the College is determined by other grants received as well as by the anticipated family contribution.

In keeping with the policy of basing financial aid upon need, the College reviews each student's award annually. Mid-year each student who has aid must submit a new financial aid application for the next academic year. A student's aid is not withdrawn unless need is no longer demonstrated. Assistance is available only for the duration of a normal length undergraduate program (8 semesters) and while a student makes satisfactory academic progress. Students who choose to live off campus may not receive College assistance in excess of their College bill, although the cost of living off campus will be recognized in the calculation of a student's financial need and outside sources of aid may be used to help meet off-campus living costs.

Students who have not previously received financial aid may apply if special circumstances have arisen. A student who marries may continue to apply for aid, but a contribution from the parents is expected equal to the contribution made were the student single.

GRANTS

For the academic year 1985-86 the College awarded almost $4,000,000 in grants. About one half of that sum was provided through the generosity of alumni and friends by special gifts and the endowed scholarships listed on pp. 23-31. The Federal government also makes Pell Grants and Supplemental Educational Opportunity Grants available. It is not necessary to apply for a specific College scholarship; the College decides who is to receive endowed scholarships and others are helped from general scholarship funds. Although some endowed scholarships are restricted by locality, sex, religion or physical vigor, the College's system of awarding aid makes it possible to meet need without regard to these restrictions. *Financial need is a requirement for all scholarships unless otherwise indicated.*

LOAN FUNDS

Long-term, low-interest loan funds with generous repayment terms combine with Swarthmore's program of grants to enable the College to meet the needs of each student. Although most offers of support from the College include elements of self-help (work and borrowing opportunities), the College strives to keep a student's debt at a manageable level.

Aided students will be expected to meet a portion of their demonstrated need (from $800 to about $1,900) through the National Direct Student Loan (NDSL), the Swarthmore College Loan (SCL), or the Guaranteed Student Loan (GSL) Programs. (Aid applicants need not request consideration for these loans since the College will determine which source is appropriate for the student.) Each of these programs allows the borrower to delay repayment until after leaving school, and each allows deferment of the debt if the borrower goes on to graduate school. Up to 10 years may be taken to repay NDSL, SCL, or GSL Loans. No separate application is needed for the NDSL or SCL loans since the College administers these funds. GSL applications must be initiated by the student with the lender, the student's local bank. Interest on these loans (5% for the NDSL and SCL loans and 8% for GSL loans) does not accrue for an enrolled student although interest does accrue on the unpaid balance once the student is no longer in school.

Students whose families do not receive College support may wish to borrow to help meet College expenses. The GSL and the PLUS loan programs are available for this purpose.

Most students whose family income does not exceed $75,000 will be allowed to borrow up to $2,500 per year through the GSL Program (up to $12,500 for the full undegraduate program). Parents may borrow up to $3,000 per year through the PLUS Loan Program. Although a 10-year repayment schedule is possible for the PLUS Loan, repayment must begin soon after the lender (the student's local bank) disburses the funds. The PLUS Loan currently carries a 12% interest rate.

The Swarthmore Family Loan (SFL), available to credit-worthy Swarthmore parents, provides up to $5,000 per year at a variable rate (91-day T. Bill plus 3%). Repayment begins soon after the loan is arranged. Parents who borrow $20,000 through the SFL Program will be asked to repay $225 per month for 10 years.

Students who would like more information about these loan programs should read our Financial Aid Brochure.

The College also maintains special loan funds which are listed below:

The Class of 1916 Loan Fund
The Class of 1920 Loan Fund
The Class of 1936 Loan Fund
The Class of 1937 Loan Fund
The John A. Miller Loan Fund
The Paul M. Pearson Loan Fund
The Thatcher Family Loan Fund
The Ellis D. Williams Fund
The Swarthmore College Student Loan Fund

The Joseph W. Conard Memorial Fund, established by friends of the late Professor Conard, provides short-term loans without interest to meet student emergencies. Income earned by *The Alphonse N. Bertrand Fund* is also available for this purpose.

STUDENT EMPLOYMENT

Student employment on the Swarthmore campus is handled by the Student Employment Office, which is under student direction. Jobs are available in such areas as the dining hall, library, departmental offices, and the post office, and placements can be arranged when students arrive in the fall. On-campus rates of pay run from $3.35 to $3.55 per hour. Students receiving financial aid are usually offered the opportunity to earn up to $800 during the year and are given hiring priority, but there are usually jobs available for others who wish employment.

The Student Employment Office publicizes local off-campus and temporary employment

opportunities. Students are generally able to carry a moderate working schedule without detriment to their academic performance.

For students who qualify under the federal College Work-Study Program (most aided students), off-campus placements in public or private, non-profit agencies in the local or Philadelphia area can be arranged through the Financial Aid Office during the academic year or nation-wide during the summer. Among suitable agencies are hospitals, schools, museums, social service agencies and local, state or federal government agencies.

Swarthmore College National and Regional Scholarships

On occasion Swarthmore College awards four-year National Scholarships to the outstanding men and women entering the freshman class.

The awards are made to those candidates who, in the opinion of Committee of Award, rank highest in scholarship, leadership, character, and personality. The amount of the annual award varies from $3,000, the minimum stipend, or enough to cover all expenses, depending on the financial need of the winner.

Other Scholarships

(Financial need is a requirement for all scholarships unless otherwise indicated. No separate application is needed.)

The Aetna Life and Casualty Foundation Scholarship provides assistance to qualified students with financial need.

The Lisa P. Albert Scholarship is awarded to a young man or woman on the basis of scholarship and need with preference given to those with a demonstrated interest in the humanities.

The Vivian B. Allen Foundation provides scholarship aid to enable foreign students to attend Swarthmore College, as part of the Foundation's interest in the international exchange of students.

The Jonathan Leigh Altman Scholarship, given in memory of this member of the Class of 1974 by Shing-mei P. Altman '76, is awarded to a junior who has a strong interest in the studio arts. It is held during the senior year. The recipient may apply for up to $2,000 for a fellowship in art to be carried out during the summer between the junior and senior year, with the balance of funds available to be used during the academic year, or postgraduately.

The Evenor Armington Scholarship is given each year to a worthy student with financial need in recognition of the long-standing and affectionate connection between the Armington family and Swarthmore College.

The Frank and Marie Aydelotte Scholarship is awarded to a new student who shows promise of distinguished intellectual attainment based upon sound character and effective personality. The award is made in honor of Frank Aydelotte, President of the College from 1921-1940, and originator of the Honors program at Swarthmore, and of Marie Osgood Aydelotte, his wife.

The W. Herman Barcus Scholarship Fund was established in 1982 in memory of W. Herman Barcus, Class of 1927. It is awarded to a meritorious student who has financial need.

The Philip H. Barley Memorial Scholarship, established in memory of Philip H. Barley, '66, by his family and friends and the Class of 1966, which he served as president, provides financial assistance for a junior or senior who has demonstrated outstanding leadership qualities at Swarthmore.

The Boyd and Ruth Barnard Fund Grants are awarded by the Department of Music to students at the College who show unusual promise

as instrumentalists or vocalists and who need help to pay for private instruction.

The Franklin E. Barr, Jr. '48 Scholarship is awarded to a freshman student who has broad academic and extracurricular interests and who shows promise of developing these abilities for the betterment of society. This scholarship is based on need and is renewable for four years.

The Belville Scholarship has been endowed in memory of Robert Chambers Belville and Margaret Klein Belville. It is awarded annually to an incoming student of particular promise and is renewable for his or her years at Swarthmore.

The Curtis Bok Scholarship was established in the College's Centennial Year 1964 in honor of the late Philadelphia attorney, author and jurist, who was a Quaker and honorary alumnus of Swarthmore. The scholarship is assigned annually to a junior or senior whose qualities of mind and character indicate a potential for humanitarian service such as Curtis Bok himself rendered and would have wished to develop in young people. Students in any field of study, and from any part of this country or from abroad, are eligible. The scholarship is renewable until graduation.

The Book and Key Scholarship, established by the Book and Key men's senior honorary society in 1965 when the Society dissolved itself, is awarded each year to a senior man who has shown quality of leadership and has demonstrated through past performance his eagerness to give service to college and community. He should rank high in scholarship, character and personality.

The Edward S. Bower Memorial Scholarship, established by Mr. and Mrs. Ward T. Bower in memory of their son, Class of '42, is awarded annually to a man or woman student who ranks high in scholarship, character, and personality.

The Daniel Walter Brenner Memorial Scholarship, established by family and friends in memory of Daniel W. Brenner, Class of 1974, is awarded to a senior majoring in biology who is distinguished for scholarship and an interest in plant ecology, or wildlife preservation, or animal behavior research. The recipient is chosen with the approval of biology and classics faculty.

The Leon Willard Briggs Scholarship was established by a bequest of Ina Carey Diller in honor of Leon Willard Briggs '17, to be awarded to worthy engineering students with financial need. In the event there are no engineering students who need the scholarships, they shall be awarded to students engaged primarily in the study of classics and belles lettres.

The John S. Brod '34 Scholarship is awarded to a deserving student on the basis of merit and financial need.

The Robert C. Brooks Scholarship was established as a memorial to Professor Brooks by a number his former students. It is available to a major in Political of Science in the junior or senior year.

The Edna Pownall Buffington Fund was established during the College's Centennial Year of 1964. The income from this Fund is used to provide scholarships for a student or students attending Swarthmore College who are concentrating their studies in the field of the social sciences and who indicate an interest in the objects or purposes of the American Friends Service Committee and a desire to serve in those fields following their graduation and post-graduate work. Awards are made to students in any of the four classes.

The Chi Omega Scholarship provides an award annually to a member of the freshman class. Preference is given to daughters or sons of members of the fraternity.

The Susan P. Cobbs Scholarship, established in 1977 through a bequest by Susan P. Cobbs, Dean Emerita of Swarthmore, is awarded to a junior or senior student majoring in some branch of the Classics. The recipient is designated by the Classics Department.

The Cochran Memorial Scholarship was established by a bequest of Marie Cochran in memory of the Cochran family. It is given annually to a student matriculating at Swarthmore College.

The Sarah Antrim Cole Scholarship was founded by her parents in memory of Sarah Antrim Cole of the Class of 1934. Preference is given to a graduate of the Worthington High School, Worthington, Ohio.

The Charles A. Collins Scholarship Fund is awarded every year to a deserving student who is in need of financial assistance, in accordance with the donor's will.

The N. Harvey Collisson Scholarship established by his family and the Olin Mathieson Charitable Trust in memory of N. Harvey Collisson of the Class of 1922 is awarded to a freshman man or woman. Selection will place emphasis on character, personality and ability.

The Stephanie Cooley '70 Scholarship, established in loving memory by her parents, is awarded on the basis of financial need to a worthy student from Kifissia, Greece.

The David S. Cowden Scholarship was established by Professor David S. Cowden, Class of 1942, who taught English Literature at Swarthmore from 1949 until his death in May 1983. It is awarded on the basis of financial need.

The Ellsworth F. Curtin Memorial Scholarship was established by Margaretta Cope Curtin, Class of 1918, in memory of her husband, Class of 1916, to benefit an engineering student with financial need.

The Marion L. Dannenberg Scholarship is awarded to a freshman student with financial need who ranks high in personality, character and scholarship. This endowment is in memory of Mrs. Dannenberg who was mother and grandmother of six students who attended Swarthmore.

The Delta Gamma Scholarship is to be awarded to a blind student at Swarthmore College. In any year in which there is no such candidate the fund may be awarded to a freshman woman.

The Francis W. D'Olier Scholarship, in memory of Francis W. D'Olier of the Class of 1907, is awarded to a freshman. Selection will place emphasis on character, personality and ability.

The Howard S. and Gertrude P. Evans Scholarship Fund provides scholarships for worthy students, preference being given to students with highest scholarship from high schools of Delaware County, PA.

The J. Horace Ervien Scholarships are awarded annually, with preference given to students who plan to major in engineering. Consideration will be given to academic qualifications, financial need, character and qualities of leadership. The scholarship is renewable for qualified students. These scholarships were named in a bequest by Mrs. Elsa G. Giele Ervien in honor of her husband, J. Horace Ervien, B.S. '03, C.E. '10.

The Theodore and Elizabeth Friend Scholarship is established as an expression of respect and appreciation by Board members and others who have been associated with them in the service of Swarthmore College. The scholarship will be awarded each year on the basis of need to a worthy student.

The Joyce Mertz Gilmore Scholarship is awarded to an entering freshman, and may be renewed for each of the following three undergraduate years. The recipient is chosen on the basis of mental vigor, concern for human welfare, and the potential to contribute to the College and the Community outside. The award was established in 1976 by Harold Mertz '26 in memory of Joyce Mertz Gilmore, who was a member of the class of 1951.

The Barbara Entenberg Gimbel Scholarship Fund was endowed in memory of Barbara Entenberg Gimbel '39 by her husband, Dr. Nicholas S. Gimbel. The scholarship is awarded on the basis of need to a worthy student, with preference to a black candidate.

The Mary Lippincott Griscom Scholarship is given to a woman student with financial need, who ranks high in character, personality and scholarship. Preference is given to a member of the Society of Friends.

The Stella and Charles Guttman Foundation Scholarships were established in 1964 by a grant from the Foundation to provide scholarships to defray all or part of the cost of tuition and fees for students who require financial assistance. Preference is given to students of recognized ability who have completed two academic years of college and who are contemplating graduate or professional study. The scholarships are renewable for a second year.

The J. Philip Herrmann Scholarship is awarded to an entering freshman on the basis of merit and need and is renewable annually to graduation. This award was established by Katharine F. Herrmann '14 and by Margaret Herrmann Ball '24 in honor of their father.

The A. Price Heusner Scholarship, given by his family in memory of A. Price Heusner, Class of 1932, is awarded to an upperclassman from the Middle West. Preference is given to a premedical student. Consideration is given to the candidate's character, demonstrated concern for the welfare of others, and participation in

team activities, as well as academic standing.

The Rachel W. Hillborn Scholarship was founded by Anne Hillborn Philips of the Class of 1892 in memory of her mother, with the stipulation that the income shall go to a student in the junior or senior class who is studying for service in the international field. Preference is given to a Friend or to one who intends to contribute to world understanding through diplomatic service, participation in some international government agency, the American Friends Service Committee, or similar activities.

The Hadassah M.L. Holcombe Scholarship is awarded to a freshman with financial need and is renewable for four years at the discretion of the College. Preference will be given to members of the Society of Friends.

The Carl R. Horten '47 Scholarship was created by the Ingersoll-Rand Company. Preference in the awarding is given to students planning to major in engineering or pre-law.

The Richard Humphreys Fund Scholarship provides assistance to a student (or students) of African descent.

The Everett L. Hunt Scholarship, endowed by the Class of 1937 in the name of its beloved emeritus professor and dean, provides an unrestricted scholarship to be awarded annually by the College.

The Betty P. Hunter Scholarship Fund. Betty P. Hunter, Class of 1948, one of the first Black students to attend Swarthmore College, established this fund through a bequest "to provide scholarship aid to needy students."

The Aaron B. Ivins Scholarship is awarded annually to a young man of the graduating class of Friends Central School, Overbrook, Philadelphia. This scholarship is awarded by the faculty of Friends Central School, and is subject to the approval of Swarthmore College.

The George K. and Sallie K. Johnson Fund provides aid during the senior year for young women who are fitted to become desirable teachers.

The Howard Cooper Johnson Scholarship, established by Howard Cooper Johnson '96, is awarded on the basis of all-around achievement to a male undergraduate who is a member of the Society of Friends.

The Richard Kahn Scholarship is given in memory of Richard G. Kahn '45 by his wife.

Kappa Alpha Theta Scholarship, established by Kappa Alpha Theta Fraternity at Swarthmore, is awarded annually to a woman student.

The Kappa Kappa Gamma Scholarship provides an award to a member of the freshman class, renewable each year. Preference is given to a relative of members of the fraternity.

The Kennedy Scholarship is given in honor of the parents and with thanks to the children of Christopher and Jane Kennedy. The scholarship is awarded on the basis of need and merit and is renewable for four years.

The Paul and Mary Jane Kopsch Scholarship Fund, established through a gift of Paul J. Kopsch of the Class of '46, is awarded each year to a junior premedical student(s) with financial need. The scholarship is renewable in the senior year.

The Jessie Stevenson Kovalenko Scholarship Fund, the gift of Michel Kovalenko in memory of his wife, is awarded to a student, preferably a woman, in her junior or senior year and a major in astronomy, or to a Swarthmore graduate, preferably a woman, for graduate work in astronomy at Swarthmore or elsewhere.

The Walter W. Krider Scholarship was established by his wife and daughter for a young man who ranks high in scholarship, character and personality.

The Lafore Scholarship is awarded in memory of John A. Lafore of the Class of 1895. The College in granting this scholarship gives preference to qualified candidates who are descendants of Amand and Margaret White Lafore.

The Barbara Lang Scholarship is awarded to a student in the junior class whose major is in the arts, preferably in music, who ranks high in scholarship and has financial need. It is renewable in the senior year. This scholarship was established by Eugene M. Lang '38 in honor of his sister.

Eugene M. Lang Opportunity Grants. Awarded each year to as many as four entering students. Selection by a special committee on the basis of distinguished academic and extra-curricular achievement and demonstrable interest in social service. Stipends are based on financial need

and take the form of full grants up to the amount of total college charges. Each Lang Scholar is also eligible for summer or academic year research or community service support, while an undergraduate, up to a maximum of $5,000 and for a $2,000 fellowship for graduate study. The program is made possible by the gift of Eugene M. Lang '38.

The Ida and Daniel Lang Scholarship established by their son, Eugene M. Lang of the Class of 1938, provides financial assistance for a man or woman who ranks high in scholarship, character and personality.

The E. Hibberd Lawrence Scholarship provides for a scholarship to an incoming freshman man or woman who ranks high in scholarship, character, and personality.

The Stephen Girard Lax Scholarship, established by family, friends and business associates of Stephen Lax '41, is awarded on the basis of financial need every two years to a student entering the junior year and showing academic distinction, leadership qualities, and definite interest in a career in business.

The Scott B. Lilly Scholarship, endowed by Jacob T. Schless of the Class of 1914 at Swarthmore College, was offered for the first time in 1950. This scholarship is in honor of a former distinguished Professor of Engineering and, therefore, students who plan to major in engineering are given preference. An award is made annually.

The Christian R. and Mary F. Lindback Foundation Scholarship is awarded to deserving students from the States of Pennsylvania, New Jersey, Delaware or Maryland.

The Long Island Quarterly Meeting, N.Y., Scholarship, is awarded annually by a committee of that Quarterly Meeting.

The Mary T. Longstreth Scholarship was founded by Rebecca C. Longstreth in memory of her mother and is awarded annually to assist a young woman student to pursue her studies in the College.

The David Laurent Low Memorial Scholarship, established by Martin L. Low, Class of 1940, his wife, Alice, Andy Low, Class of 1973, and Kathy Low in memory of their son and brother, is awarded to a man or woman who gives the great promise that David himself did. The award assumes both need and academic excellence, and places emphasis, in order, on qualities of leadership, a concern for others, character and/or outstanding and unusual promise. The scholarship is awarded to a freshman and is renewable for the undergraduate years.

The Clara B. Marshall Scholarship, established by the will of Dr. Clara B. Marshall, is awarded to a woman at Swarthmore College with preference given to descendants of her grandfathers, Abram Marshall or Mahlon Phillips.

The Edward Martin Scholarships, established by a bequest of Edward Martin, friend of Swarthmore College, provides financial aid to juniors and seniors majoring in Biology, or pre-medical students taking substantial work in this field. Awards are made in consultation with the Department of Biology.

The Dorothy Maynor Scholarship, established by the Hearst Foundation, is awarded to a student from the Harlem School of the Arts in honor of its founder. It provides a grant for the full amount of need and for music lessons. The awardee will be nominated by the Harlem School of the Arts and selected by Swarthmore College on the basis of all-around qualifications.

The Thomas B. McCabe Achievement Awards, established by Thomas B. McCabe '15, are awarded to entering students from the Delmarva Peninsula, and Delaware County, Pennsylvania, who give promise of leadership. In making selections, the Committee places emphasis on ability, character, personality, and service to school and community. These awards provide a minimum annual grant of tuition, or a maximum to cover tuition, fees, room and board, depending on need. Candidates for the McCabe Awards must apply for admission to the College by January 15.

The Peter Mertz Scholarship is awarded to an entering freshman outstanding in mental and physical vigor, who shows promise of spending these talents for the good of the college community and of the larger community outside. The award was established in 1955 by Harold, LuEsther and Joyce Mertz in memory of Peter Mertz, who was a member of the class of 1957. It is renewable for the undergraduate years.

The James E. Miller Scholarship. Under the will

of Arabella M. Miller, funds are available annually for students from Delaware County (with preference for residents of Nether Providence Township).

The Margaret Moore Scholarship Fund provides scholarships to foreign students with a preference given to students of South Asian origin.

The Florence Eising Naumburg Scholarship, named in 1975 in honor of the mother of an alumna of the Class of 1943, is awarded to a student whose past performance gives evidence of intellectual attainment, leadership, and character, and who shows potential for future intellectual growth, creativity, and scholarship, and for being a contributor to the College and ultimately to society.

The John H. Nixon Scholarship was established by John H. Nixon, Class of '35, to assist Third World students, especially those who plan to return to their country of origin.

The Howard Osborn Scholarships, established by Howard Osborn in memory of his mother and father, Viola L. Osborn and Frank Osborn, are awarded to worthy students of good character who maintain satisfactory grades and who require financial assistance.

The Harriet W. Paiste Fund provides a scholarship for a young woman who is a member of the Society of Friends (Philadephia Yearly Meeting).

The Rogers Palmer Scholarships, established in 1973 by Rogers Palmer of the Class of 1926, are awarded to members of the freshman class who show promise of leadership and who have need of financial assistance. The scholarships are renewable for a total of four years at the discretion of the College.

The T. H. Dudley Perkins Memorial Scholarship is awarded annually to an entering freshman on the basis of qualities of manhood, force of character and leadership; literary and scholastic ability; physical vigor as shown by participating in out-of-doors sports or in other ways.

The Cornelia Chapman and Nicholas O. Pittenger Scholarship established by family and friends is awarded to an incoming freshman man or woman who ranks high in scholarship, character and personality and who has need for financial assistance.

The Anthony Beekman Pool Scholarship. This scholarship is awarded to an incoming freshman man of promise and intellectual curiosity. It is given in memory of Tony Pool of the Class of 1959.

The Presser Foundation Scholarship is awarded annually to one or more students, selected by the President and the Department of Music, who plan to become teachers of music.

The Mary Coates Preston Scholarship Fund. A sum of money has been left by the will of Elizabeth Coates, the annual interest of which provides a scholarship to a young woman student in Swarthmore College. Preference is given to a relative of the donor.

The Robert Pyle Scholarship was established by his sisters, Margery Pyle and Ellen Pyle Groff, in memory of Robert Pyle of the Class of 1897 and for many years a member of the Board of Managers. Applicants who show promise of intellectual attainment based upon sound character and effective personality and who reside in Chester County are given preference.

The Raruay-Chandra and Niyomsit Scholarships are given by Renoo Suvarnist '47 in memory of his parents. They are given in alternate years: the Ruruay-Chandra Scholarship to a woman for her senior year, and the Niyomsit Scholarship to a man for his senior year, who has high academic standing and real need for financial aid. Preference is given to a candidate who has divorced or deceased parents or a deceased mother or father.

The Fred C. and Jessie M. Reynolds Scholarship Fund, created through a testamentary gift of Jean Reynolds '32, is awarded each year to a worthy student based on need.

The Lily Tily Richards Scholarship, established by Peirce L. Richards, Jr., in memory of his wife, Lily Tily Richards '29, is awarded to a woman distinguished for high scholarship, character, personality and physical vigor.

The Adele Mills Riley Memorial Scholarship, founded by her husband, John R. Riley, was awarded for the first time for the academic year 1964-65. An annual award subject to renewal is made to a deserving student, man or woman. Selection stresses the candidate's capacity for significant development of his or her interests and talents during the college years. Qualities

of intellectual promise as well as potential for service are sought in making this appointment.

The Byron T. Roberts Scholarship, endowed by his family in memory of Byron T. Roberts, '12, is awarded annually to an incoming student and is renewable for his or her years of study at Swarthmore.

The Louis N. Robinson Scholarship was established during the College's Centennial year by the family and friends of Louis N. Robinson. Mr. Robinson was for many years a member of the Swarthmore College faculty and founder of the Economics Discussion Group. A member of the junior or senior class who has demonstrated interest and ability in the study of Economics is chosen for this award.

The Alexis Rosenberg Scholarship Fund, established by The Alexis Rosenberg Foundation, provides aid for a freshman student. It is awarded annually to a worthy student who could not attend the College without such assistance.

The Edith A. Runge Scholarship Fund, established by the will of Edith A. Runge of the Class of 1938, provides assistance annually to students who have need of financial aid.

The David Barker Rushmore Scholarship, established in honor of David Barker Rushmore, Class of 1894, by his niece Dorothea Rushmore Egan '24, is awarded annually to a worthy student who plans to major in Engineering or Economics.

The Katharine Scherman Scholarship is awarded to a student with a primary interest in the arts and the humanities, having special talents in these fields. Students with other special interests, however, will not be excluded from consideration. Awarded in honor of Katharine Scherman, of the Class of 1938, it is renewable for the full period of undergraduate study.

The William G. and Mary N. Serrill Honors Scholarship is a competitive scholarship for men, awarded to a candidate for admission to the College, based upon the general plan of the Rhodes Scholarships. Preference will be given to men who are residents of Abington Township, including Jenkintown and Glenside, Montgomery County, Pennsylvania.

The Clinton G. Shafer Scholarship endowed by his family in memory of Clinton G. Shafer, of the Class of 1951, is awarded to students interested in engineering and physical science. The committee in making its selection considers character, personality and leadership.

The Annie Shoemaker Scholarship is granted annually to a young woman of the graduating class of Friends Central School, Overbrook, Philadelphia. This scholarship is awarded by the faculty of Friends Central School, and is subject to the approval of Swarthmore College.

The Sarah W. Shreiner Scholarship, given in loving memory by her daughter, Leah S. Leeds of the Class of 1927, is awarded annually to a woman who ranks high in scholarship, character and personality.

The William C. and Barbara Tipping Sieck Scholarship is awarded annually to a student showing distinction in academics, leadership qualities and extra-curricular activities and who indicates an interest in a career in business.

The Nancy Baxter Skallerup Scholarship, established by her husband and children, is awarded to an incoming freshman with financial need. It is renewable for up to four years.

The William W. Slocum, Jr. Scholarship fund established in 1981 by a member of the Class of 1943 is awarded to a deserving student on the basis of merit and need.

The W. W. Smith Charitable Trust provides scholarships to students who qualify on the basis of need and merit.

The Cindy Solomon Memorial Scholarship is awarded by preference to a young woman in need of financial assistance, and who has special talent in poetry or other creative and imaginative fields.

The Babette S. Spiegel Scholarship Award, given in memory of Babette S. Spiegel, Class of 1933, is awarded to a student showing very great promise as a creative writer (in any literary form) who has need of financial assistance. The Department of English determines those eligible.

The Harry E. Sprogell Scholarship was established in 1981 in memory of Harry E. Sprogell '32, and in honor of his class's 50th reunion. It is awarded to a junior or senior with financial need who has a special interest in law or music.

The Clarence K. Streit Scholarship is awarded to a student entering the junior or senior year and majoring in history. Preference is given to persons, outstanding in initiative and scholarship, who demonstrate a particular interest in American pre-Revolutionary War History. This scholarship honors Clarence K. Streit, author of *Union Now: A Proposal For An Atlantic Federal Union of the Free,* whose seminal ideas were made public in three Cooper Foundation lectures at Swarthmore.

The Katharine Bennett Tappen, Class of 1931, Memorial Scholarship, established in 1980 is awarded to a freshman student. The scholarship is renewable for four years at the discretion of the College. Preference is given to a resident of the Delmarva Peninsula.

The Newton E. Tarble Award, established by Newton E. Tarble of the Class of 1913, is granted to a freshman man who gives promise of leadership, ranks high in scholarship, character and personality, and resides west of the Mississippi River or south of Springfield in the State of Illinois.

The Jonathan K. Taylor Scholarship, in accordance with the donor's will, is awarded by the Board of Trustees of the Baltimore Monthly Meeting of Friends. First preference is to descendants of Jonathan K. Taylor; then to members of the Baltimore Yearly Meeting of Friends; then to others.

The Phebe Anna Thorne Fund provides an income for scholarships for students whose previous work has demonstrated their earnestness and ability. This gift includes a clause of preference to those students who are members of the New York Monthly Meeting of Friends.

The Titus Scholarships established by the will of Georgiana Titus of the Class of 1898 are to young awarded women in order that they may pursue their studies in the College.

The Audrey Friedman Troy Scholarship, established by her husband, Melvin B. Troy '48, is awarded to a freshman man or woman. The scholarship is renewable for four years at the discretion of the College. In awarding the scholarship, prime consideration is given to the ability of the prospective scholar to profit from a Swarthmore education, and to be a contributor to the College and ultimately to society.

The Daniel Underhill Scholarship was established by a bequest from Edward Clarkson Wilson '91, and a gift from Daniel Underhill '94, in memory of this member of the first Board of Managers. The award is made at the discretion of the College.

The William Hilles Ward Scholarships, in memory of William Hilles Ward of the Class of 1915, are awarded annually, preferably to students who plan to major in science. The committee in making its selection has regard for candidates who are most deserving of financial assistance.

The Stanley and Corinne Weithorn Scholarship Fund was established to provide financial assistance on the basis of need and merit.

The Barclay and Edith Lewis White Scholarship is awarded annually by the Music Department to a student of music.

The Samuel Willets Fund. This fund provides an annual income for scholarships. A portion of the fund is assigned for scholarships in the name of Mr. Willets' children, Frederick Willets, Edward Willets, Walter Willets, and Caroline W. Frame.

The I. V. Williamson Scholarship. Preference is given to graduates of Friends Central, George School, New York Friends Seminary, Baltimore Friends School, Wilmington Friends School, Moorestown Friends School, Friends Academy at Locust Valley, Sidwell Friends School and Brooklyn Friends School.

The Edward Clarkson Wilson Scholarship has been established at Swarthmore by friends of Edward Clarkson Wilson, '91, formerly Principal of the Baltimore Friends School. It is awarded each year to a former student of the Baltimore Friends School, who has been approved by the faculty of the school, on the basis of high character and high standing in scholarship.

The Elmer L. Winkler Scholarship Fund, established in 1980 by a member of the class of 1952, is awarded annually to a deserving student on the basis of merit and need.

The Letitia M. Wolverton Scholarship Fund, given by Letitia M. Wolverton of the Class of 1913, provides scholarships for members of the junior and senior classes who have proved to be capable students and have need for financial

assistance to complete their education at Swarthmore College.

The Mary Wood Fund provides a scholarship which may be awarded to a young woman who is preparing to become a teacher.

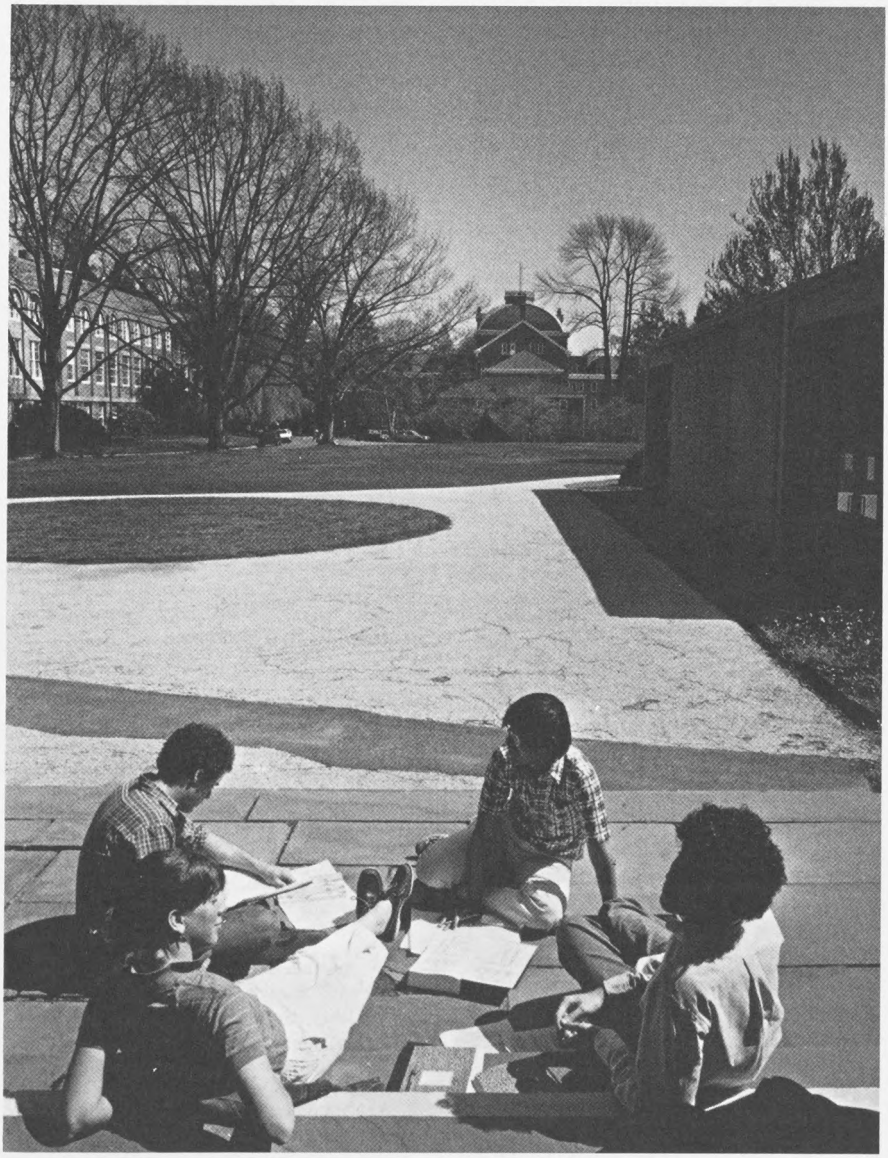
The Roselynd Atherholt Wood '23 Fund provides a scholarship for a young man or woman with financial need who is distinguished for intellectual promise as well as potential for service.

The Michael M. and Zelma K. Wynn Scholarship was established in 1983 by Kenneth R. Wynn '73 in honor of his mother and father. It is awarded annually to a student on the basis of need and merit.

The income from each of the following funds is awarded at the discretion of the College.

The Barclay G. Atkinson Scholarship Fund
The Rebecca M. Atkinson Scholarship Fund
The Chemical Bank
The Class of 1913 Scholarship Fund
The Class of 1914 Scholarship Fund
The Class of 1915 Scholarship Fund
The Class of 1917 Scholarship Fund
The Class of 1925 Scholarship Fund
The Class of 1956 Scholarship Fund
The William Dorsey Scholarship Fund
The George Ellsler Scholarship Fund
The Joseph E. Gillingham Fund
The Thomas L. Leedom Scholarship Fund
The Sarah E. Lippincott Scholarship Fund
The David L. Price Scholarship
The Reader's Digest Foundation Endowed Scholarship Fund
The Mark E. Reeves Scholarship Fund
The Caroline Shero Scholarship Fund
The Frank Solomon Memorial Scholarship Fund
The Mary Sproul Scholarship Fund
The Helen Squier Scholarship Fund
The Walter Frederick Sims Scholarship Fund
The Helen G. Stafford Scholarship Fund
The Francis Holmes Strozier Memorial Scholarship Fund
The Joseph T. Sullivan Scholarship Fund
The Deborah F. Wharton Scholarship Fund
The Thomas H. White Scholarship Fund
The Edward Clarkson Wilson and Elizabeth T. Wilson Scholarship Fund
The Thomas Woodnutt Scholarship Fund

College Life Student Community



College Life

HOUSING

Swarthmore is primarily a residential college, conducted on the assumption that the close association of students and instructors is an important element in education. Most students live in College dormitories, which include coeducational housing as well as single sex dormitories and sections. Many members of the faculty live on or near the campus, and are readily accessible to students.

Residence Halls

Twelve residence halls, ranging in capacity from 21 to 235 students, offer a diversity of housing styles. These dormitories include: Woolman House; Dana and Hallowell Halls, which were opened in 1967; the upper floors in the wings of Parrish Hall; Wharton Hall, named in honor of its donor, Joseph Wharton, at one time President of the Board of Managers; Palmer, Pittinger, and Roberts Halls on South Chester Road; one building on the Mary Lyon School property; Worth Hall, the gift of William P. and J. Sharples Worth, as a memorial to their parents; Willets Hall, made possible largely by a bequest from Phebe Seaman, and named in honor of her mother and aunts; and Mertz Hall, the gift of Harold and Esther Mertz.

About eighty percent of dormitory areas are designated as coeducational housing either by floor, section, or entire dorm; the remaining areas are reserved for single sex housing. Dormitory sections may determine their own visitation hours up to and including twenty-four-hour visitation.

New students are assigned to rooms by the Deans. Efforts are made to follow the preferences indicated, and to accommodate special needs, such as physical handicaps. Other students choose their rooms in an order determined by lot. All students are expected to occupy the rooms to which they are assigned or which they have selected through the regular room choosing process unless authorized by the Deans to move. Permission must also be obtained from the Deans to reside outside college housing.

Resident Assistants, selected from the junior and senior classes, are assigned to each of the dormitory sections.

Dormitories remain open during October and Thanksgiving breaks but are closed to student occupancy during Christmas and Spring vacations. Students enrolled for the fall semester only are expected to vacate their dormitory rooms within twenty-four hours after their last scheduled examination. Freshmen, sophomores, and juniors are expected to leave immediately after their last examination in the spring so that their rooms may be prepared for use by Commencement visitors.

The insurance program for the College is designed to provide protection for College property and does not include the property of students or others. Students and their parents are strongly urged to review their insurance program in order to be sure that coverage is extended to include personal effects while at college.

Sharples Dining Hall

All students living on campus are required to subscribe to the College board plan for meals in the Philip T. Sharples Dining Hall. The board plan covers 19 meals a week. Although an effort is made to meet the dietary needs of all students, not all special requirements can be accommodated; permission to reside off campus will be extended to any student not able to participate in the board plan. The dining hall is closed during the Christmas and Spring vacations.

SOCIAL CENTERS

Tarble Social Center

Through the generosity of Newton E. Tarble of the Class of 1913, the building which formerly housed the College Library was completely renovated and, since 1967, has served as the College's Social Center. Currently under reconstruction, it includes recreational facilities, a lounge, and a snack bar. Under the leadership of a Director of Student Activities and student co-directors, many major social activities (parties, concerts, plays, etc.) are held in Tarble. The Club, a student-run coffeehouse, is temporarily housed in Sharples II.

Other Centers

The Alice Paul Women's Center, housed in Sharples I, was established to draw all women of the Swarthmore community together through common concerns. The Center, which serves faculty, students, faculty wives, staff and alumnae, maintains a library of resource books, pamphlets and periodicals, provides information, and sponsors a variety of programs, lectures, discussions and symposia for all members of the college community about issues relating to women.

A *Black Cultural Center*, located in the Caroline Hadley Robinson House, provides a library and facilities for various cultural activities of special interest to black students. The Center and its program are guided by a director and a committee of black students, faculty, and administrators. Programs planned by the Center are open to all members of the College community.

There are three fraternities at Swarthmore; Delta Upsilon and Phi Sigma Kappa are affiliated with national organizations, while Phi Omicron Psi is a local association. Fraternities are adjuncts to the college social program and maintain separate lodges on campus. The lodges do not contain dormitory accommodations or eating facilities. New members are pledged during late fall of their first year at the College. In recent years about ten per cent of the freshman men have decided to affiliate with one of the fraternities.

RELIGIOUS LIFE

Religious life at the College is a matter of individual choice, as is consistent with Quaker principles. The Society of Friends is committed to the belief that religion is best expressed in the quality of everyday living. There are accordingly no compulsory religious exercises. Students are encouraged to attend the churches of their choice. Seven churches are located in the borough of Swarthmore; other churches and synagogues may be found in the nearby towns of Morton, Media, Chester, and Springfield.

The Swarthmore Friends Meeting House is located on the campus. Students are cordially invited to attend its meeting for worship on Sunday. Extracurricular groups with faculty cooperation exist for the study of the Bible and the exploration of common concerns of religion. They include: The Christian Fellowship and Charitas, both Christian groups; Young Friends, Ruach (Jewish Collective), Newman Club, and Ba'hai.

STUDENT SERVICES

Health and Psychological Services

The Worth Health Center, a gift of the Worth family in memory of William Penn Worth and Caroline Hallowell Worth, houses offices for the college physicians and nurses, outpatient

treatment facilities, offices of the Psychological Services director and staff, and rooms for students who require in-patient care. Registered nurses are on duty under the direction of the college physicians.

The college physicians hold office hours every weekday at the College, where students may consult them without charge. Students should report any illness to the college physicians, but are free to go for treatment to another doctor if they prefer to do so.

As a part of the matriculation process each student must submit a brief medical history and health certificate prepared by the family physician on a form supplied by the College. Pertinent information about such matters as physical reserve, unusual medical episodes, severe allergies, or psychiatric disturbances will be especially valuable to the college Health Service in assisting each student. All this information will be kept confidential.

The Health Center staff cooperates closely with the Department of Physical Education and Athletics. Recommendations for limited activity may be made for those students with physical handicaps. In occasional cases a student may be excused entirely from the requirements of the Physical Education Department, although adaptive programs are offered.

Each student is allowed ten days in-patient care in the Health Center per term without charge unless the services of a special nurse are required. After ten days, a charge of $5.00 per day is made. Students suffering from a communicable disease or from illness which makes it necessary for them to remain in bed must stay in the Health Center for the period of their illness. Ordinary medicines are furnished without cost, but a charge is made for special medicines, certain immunization procedures and laboratory tests, and transportation when necessary to local hospitals.

The medical facilities of the College are available to students injured in athletic activities or otherwise, but the College cannot assume additional financial responsibility for medical and surgical expenses arising from accidents. Insurance coverage for all students participating in athletics, however, is included in the mandatory health insurance package as is supplementary coverage for all accident injuries.

A program of psychological counseling services for students with personal or emotional problems is coordinated by a director, who also sees students for individual or group consultations. The director and the staff of psychological counselors hold office hours by appointment each week, and a consulting psychiatrist is available as necessary. Brief psychotherapy within the limits of available time will be given to students without charge. In instances where longer treatment is indicated, the student will be referred to an outside psychiatrist or psychologist.

Special educational seminars and workshops on issues of concern to the entire college community are also sponsored by the counselors, usually with the support of or in conjunction with student organizations or interest groups and the Deans. The counselors are also available to consult with faculty members, Resident Assistants, and other members of the college's supportive staff.

Student Advising

Each freshman is assigned to a faculty member who acts as course adviser until this responsibility falls to the chairman of the student's major department at the end of the sophomore year. Requests for a change of advisor should be addressed to the Dean and will be freely granted, subject only to equity in the number of advisees assigned to individual faculty members.

The Deans hold overall responsibility for the advising system. They are themselves available to all students for advice on any academic or personal matters, and for assistance with special needs, such as those arising from physical handicaps.

A consultant for testing and guidance is available to assist students with special prob-

lems of academic adjustment, study skills and reading proficiency. In addition, aptitude and interest tests may be given on request.

Career Planning and Placement

The Office of Career Planning and Placement helps students evaluate themselves and their goals in order to plan future career and life style alternatives. Individual counseling sessions and group workshops are conducted to facilitate this planning.

The programs are open to students in all classes and are developmental in nature. Workshops are designed to help students expand their career options through exploration of their values, skills, interests, abilities, and experiences. SIGI (Educational Testing Service's System of Interactive Guidance Information), a computerized source of extensive career information, is available as well.

Sophomore and junior students in particular are encouraged to test options by participating in the Extern Program. This program provides on-site experience in a variety of career fields by pairing students with an alumnus/a to work on a mutually planned task during one or more weeks of vacation. Career exploration and experiential education is also encouraged during summer internships and jobs, during a semester or year off, and during the school year. Assistance is provided in helping students locate and secure appropriate jobs, internships, and volunteer opportunities, and efforts are made to help students learn the most they can from these experiences.

Additional help is provided through career information panels, on-site field trips, workshops on topics such as resume writing and cover letter writing, interviewing skills, and job search techniques. The office cooperates with the Alumni Office, the Alumni Association, and the Parents Council to help put students in touch with a wide network of people that can be of assistance to them. The Career Resources Library includes many publications concerning all stages of the job search process. The office hosts on-campus recruiting by representatives from business, industry, government, nonprofit organizations, and graduate and professional schools. Notices of job vacancies are collected, posted, and included in the office's newsletter. Credential files are compiled for interested students and alumni to be sent to prospective employers and graduate admissions committees.

Academic Support

Academic support services include individual tutorial services; special review sections attached to introductory courses in the natural sciences; a mathematics lab; an expository writing workshop; and a pre-freshman Summer Program for selected entering students which is sponsored conjointly with Haverford and Bryn Mawr Colleges. These academic services are overseen by the Deans and a faculty committee in cooperation with the academic departments. No fees are required.

Withdrawal and Readmission for Health Reasons

Students may withdraw voluntarily because of health problems. Where health problems of a physical or psychological nature substantially interfere with a student's academic performance or safety, or the safety of others, the student may be withdrawn at the discretion of the College. The College reserves the right to require withdrawal when, in the judgment of either the Director of Health Services or the Director of Psychological Services, a student's functioning is impaired or in jeopardy.

A student who has withdrawn for health reasons may apply for readmission. Although application for readmission may be made at any time, the College expects that ordinarily readmission will not be effective except at the beginning of a semester.

A student applying to the College for readmission must provide evidence from his or her physician or psychotherapist of increased ability to function academically or of decreased hazard to health or safety. After such evidence has been provided, the student will ordinarily be required to be evaluated in person by a physician employed by the College Health Services and/or the Director of Psychological Services, as appropriate. Recommendations for readmission are made to the Dean of the College, who makes the final decision.

ALUMNI OFFICE AND PUBLICATIONS

Alumni Relations acts as the channel of communication between the College and its alumni, enabling them to maintain an on-going relationship with each other. Some of the office's programs and activities include Alumni Day in the spring, Homecoming Day in the fall, Swarthmore Today, alumni gatherings off campus all over the country, alumni travel tours, and special events such as centennial celebrations. It also plans the annual Parents' Day/Student Arts Festival. The Alumni Office hires students as events intern, vocational intern, and intern for minority affairs each year to help coordinate these various programs. Students also work as staff for most of the campus events.

The Alumni Office also works closely with the Rapport and Support Committee of Student Council, a liaison group which promotes understanding between students and alumni and supports the College in whatever ways seem appropriate. The annual Oktoberfest weekend originated in the Rapport and Support Committee. The Alumni Office also helps officers of the senior class plan special events. Every other year the Alumni Office and the Office of Career Planning and Placement sponsor a Career Day at which students meet alumni to exchange career and graduate school information.

The Alumni Office gives staff support to the Alumni Association, which celebrated its 100th anniversary in 1981-82, and to the Alumni Council, the 42-person elected governing body of the Alumni Association.

There are 14,661 alumni: 7,609 men, 7,052 women, and 2,122 married to each other, giving substance to the traditional appelation for the College of "Quaker Matchbox." The College defines an alumnus/a as anyone who has completed one semester.

College Publications

All alumni, parents of students, seniors, faculty, and staff receive the quarterly *Alumni Bulletin* free of charge, and it is made available to all students. Other complimentary publications sent to alumni, parents, and friends are an annual engagement calendar, the *President's and Treasurer's Report*, and the quarterly *Garnet Letter*.

PUBLIC RELATIONS

The Public Relations Office works with the print and broadcasting media to provide news and information about the College to the public in neighboring communities, in the Philadelphia tri-state area, and throughout the nation. It responds to requests from the media for information on a variety of subjects by calling on the resources and expertise of the faculty and professional staff. The Public Relations Office prepares two publications: *On Campus*, a schedule of activities at the College that monthly are open to the public, distributed

on request to more than 2,000 households in the Philadelphia area, and the *Weekly News*, a newsletter of events and announcements distributed to faculty, staff, and students.

Student Community

Student Conduct

Students who choose Swarthmore as their college should understand that they are accepting social and academic standards which, while subject to periodic review, are essential to the well-being of the community. In general, the life of students should be governed by good taste and accepted practice rather than elaborate rules. Certain regulations, however, are of particular importance and are listed below.

1. The possession and use of alcoholic beverages on the campus is regulated by State law and limited to those areas of the campus which are specified by the Student Council and the Dean. The observance of moderation and decorum in respect to drink is a student obligation. Disorderly conduct is regarded as a serious offense.

2. The use or possession of injurious drugs or narcotics without the specific recommendation of a physician and knowledge of the Deans subjects a student to possible suspension or expulsion.

3. The use or possession of firearms or other dangerous weapons is not permitted. Firecrackers or other explosives are prohibited. The setting of fires outside of restricted areas is a serious offense, as is tampering with fire alarms or fire prevention equipment.

4. The participation by any student in any disruption or interference with the orderly programs, functions, or conduct of College activities of any kind is a serious offense.

5. Occupants of residence halls are expected to show consideration for other residents. Students are held responsible for the behavior of visiting guests.

6. No undergraduate may maintain an automobile while enrolled at the College without the permission of the Car Authorization Committee, a student-faculty group. This permission is not extended to freshmen. Day students may use cars for commuting to College, but special arrangements for stickers must be made for campus parking. More detailed information may be obtained from the Office of the Deans.

Penalties for violations of College regulations such as those listed above are set by judicial committees or the Deans and may involve suspensions or expulsion. Standing regulations may be modified and new rules may be added at any time upon notice to the student body.

The College reserves the right to exclude at any time students whose conduct it regards as undesirable, and without assigning any further reason therefor. Neither the College nor any of its officers shall be under any liability whatsoever for such exclusion.

Judicial Bodies

There are two judicial committees with distinct jurisdictions. The *Student Judiciary Committee*, elected by the entire student body, acts on cases of alleged violations of students' rules and campus regulations except as they fall within the sphere of the College Judiciary Committee. The *College Judiciary Committee* is composed of student, faculty, and administration members. It has primary jurisdiction over cases that may involve academic dishonesty. It also acts upon cases referred by or appealed from the Student Judiciary Committee. A more complete description of the judicial system is available from the Office of the Dean.

Student Council

The semi-annually elected Student Council represents the entire undergraduate community and is the chief body of student government. Its efforts are directed toward coordination of student activities and the expression of student opinion.

Committees of the Council include the Appointments Committee, which selects qualified applicants for student positions on student/

faculty/administration committees, Board of Managers committees, and student committees; the Budget Committee, which regulates distribution of funds to student groups, and the Elections Committee, which supervises procedures in campus elections.

Social Committee

An extensive program of social activities is managed by the Social Committee which is appointed by the Appointment Committee. The program is designed to appeal to a wide variety of interests and is open to all students. There is no charge for Social Committee functions and for most other campus events.

EXTRACURRICULAR ACTIVITIES

In addition to the foregoing organizations, Swarthmore students have an opportunity to participate in a program of extracurricular activities wide enough to meet every kind of interest. There are dozens of formal and informal organizations. They vary as greatly as the interests of the students vary. The College encourages students to participate in whatever activities best fit their personal talents and inclinations.

The Studio Arts Program

The Studio Arts Program, administered by the Department of Art, is an academic program. The Department, however, encourages that students organize and carry out independent extracurricular activities with or without the supervision of its staff, and provides assistance and advice as requested. There are in existence at present the following student-organized groups in art: Photography Club, Student Art Association, Griffin, and Student Life Drawing Class. There are looms, now unused, for those interested in forming a weaving club. The Griffin, in Parrish Hall, and Wilcox Gallery, in Beardsley Hall, often display student work.

Music

The Department of Music administers and staffs several performing organizations. The College Chorus, directed by Peter Gram Swing, rehearses three hours per week. The College Singers, a select small chorus drawn from the membership of the Chorus and conducted by Ann McNamee, rehearses an additional two hours per week. The College Orchestra, directed by Geoffrey Michaels, rehearses twice a week. The Chamber Orchestra, directed by James Freeman, gives two concerts each semester; its rehearsals closely precede the concerts and its members are drawn from The College Orchestra. The Department each year sponsors a Concerto Competition, open to all Swarthmore College students. Auditions for the competition are normally held the first Thursday after winter vacation. The winner performs later with the Orchestra. The Wind Ensemble, which rehearses one night weekly and gives two major concerts each year in addition to several outdoor performances, is under the direction of Gerald Levinson. The Early Music Ensemble, directed by Karen Meyers, meets each week and gives several concerts during the year. Instrumentalists and singers can also participate in the chamber music coaching program coordinated by Dorothy Freeman. The Orchestra (Chamber Orchestra) and Chorus (Singers) both require auditions for membership. Several student chamber music concerts (in which all interested students have an opportunity to perform) are given each semester. These concerts also provide an opportunity for student

composers to have their works performed. The Swarthmore College String Quartet, composed of four top-notch student string players who also serve as principal players in the College Orchestra and Chamber Orchestra, performs frequently at the College and at other institutions.

Practice and performance facilities in the Lang Music Building include sixteen practice rooms (each with at least one piano), a concert and a rehearsal hall (each with its own concert grand), one organ, two harpsichords, and an electronic studio. The Daniel Underhill Music Library has excellent collections of scores, books, and records.

The William J. Cooper Foundation presents a distinguished group of concerts each year on the campus. The Music Department administers a separate series of public concerts.

Beginning in 1985, the Swarthmore Music and Dance Festival will take place on campus during the first three weeks of the fall semester. It presents concerts, master classes, and symposia, focusing on contemporary American works performed and discussed by eminent artists.

Dance

The Swarthmore College Dancers perform public concerts with works choreographed by students, the dance faculty, and other professional choreographers.

For the past few years Swarthmore College has been the recipient of National Endowment for the Arts grants which have enabled the College, in conjunction with the William J. Cooper Foundation, to bring outstanding professional dance companies for short term residencies.

The Department of Physical Education and Athletics sponsors a coeducational performance group in Folk Dance.

Drama

Professor Lee Devin is Director of The Theatre. He supervises the drama program, which includes course work, workshops with guest directors, invited speakers, and a number of student-directed projects each semester. Interested students should consult the departmental statement in English Literature.

Athletics

Swarthmore's athletic policy is based on the premise that any sports program must be justified by the contributions which it can make to the educational development of the individual student who chooses to participate. In keeping with this fundamental policy, Swarthmore's athletic program is varied and extensive, offering every student a chance to take part in a wide range of sports. Within the limits of finance, personnel, and facilities, the College feels that it is desirable to have as many students as possible competing on its intercollegiate or club teams, or in intramural sports. Faculty members serve as advisers for several of the varsity athletic teams. They work closely with the teams, attending practices and many of the scheduled contests.

Interest Clubs

There are a great variety of special interest clubs, listed more fully in the *Student Handbook*. Since the interests of our students change frequently, new clubs are often formed by student groups.

Publications and Media

The *Phoenix*, the weekly College newspaper, and WSRN, the campus radio station, are both completely student-run organizations. In addition, there are a variety of other student publications, including literary magazines, newsletters, and an alternative magazine. The current list can be found in the *Handbook*.

OUTREACH PROGRAMS

Swarthmore College Upward Bound

The Upward Bound Program at Swarthmore College, begun in 1964 and continued with Federal support, is intended to provide simultaneously a valuable experience for Swarthmore students and a service to members of surrounding communities. It offers both a six-week residential summer school in which Swarthmore students may serve as counselors, and a series of activities during the academic year in which Swarthmore students serve as tutors. The program is administered by Edwin A. Collins, Project Director.

Chester Internship Program

Swarthmore students may work as volunteers or paid Interns in community agencies that rehabilitate housing, provide legal assistance, and improve the standard of living for low-income residents in Chester, Pa., a nearby city. The program was begun by students in 1983 and is now overseen by Cynthia Jetter, Co-ordinator, and a committee of faculty members, alumni, and Chester community leaders.

IV

Educational Program
Faculty Regulations
Degree Requirements

Awards and Prizes
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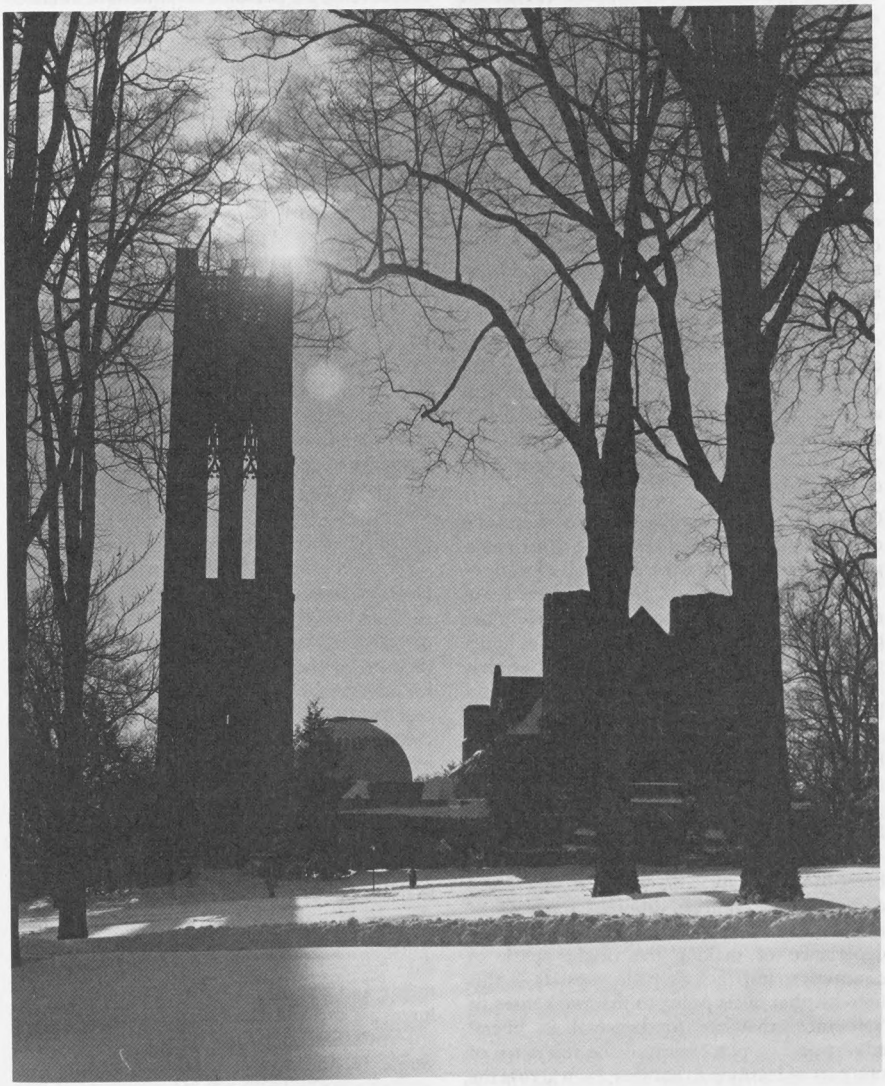


Educational Program

GENERAL STATEMENT

Swarthmore College offers the degree of Bachelor of Arts and the degree of Bachelor of Science. The latter is given only to students who major in Engineering; the former, to students in the Humanities, the Social Sciences, and the Natural Sciences. Four years of resident study are normally required for a Bachelor's degree (see page 58), but variation in this term, particularly as a result of Advanced Placement credit, is possible (see page 19).

The selection of a program will depend upon the student's interests and vocational plans. The purpose of a liberal education, however, is not primarily to provide vocational instruction, even though it provides the best foundation for one's future vocation. Its purpose is to help students fulfill their responsibilities as citizens and grow into cultivated and versatile individuals. A liberal education is concerned with the cultural inheritance of the past, with the cultivation of moral, spiritual, and aesthetic values, with the development of analytical abilities. Intellectually it aims to enhance resourcefulness, serious curiosity, open-mindedness, perspective, logical coherence, insight, discrimination.

One comprehensive review of Swarthmore's curriculum (*Critique of a College,* 1967) suggested two principles for a liberal education. "One is the principle of Depth. To make the most of a liberal education, each student must go far enough into some subjects to give him a genuine mastery of disciplinary skills, so that he can use them to generate new discoveries on his own. . . . He must go far enough to grasp systematic connections within a field, to see how fundamental principles combine to make intelligible a range of subordinate principles or phenomena. . . . The other principle is that of Diversity. To make the most of a liberal education, each student must have enough breadth and variety in his studies so that he can compare and contrast different methods of inquiry . . . , and so that he can have the experience of making the bright spark of connection leap across wide gaps. It is this breadth that gives point to the two senses of 'relevance' that are fundamental in liberal education . . . perception of the relevance of one part of learning to another, even across the boundaries of fields and subjects (and) . . . perception of the relevance of learning to the exigencies of life. . . ." To these two principles the study added that the curriculum should aim to encourage resourcefulness and self-reliance and develop the personal conditions of intellectual progress by placing substantial responsibility upon the student for his or her education, amply allowing individuality of programs and requiring important choices about the composition of programs. "What we are proposing," the study concluded, "is a curriculum that leans rather sharply toward specialized diversity, and away from uniform generality. . . . Our emphasis is on serious encounters with special topics and problems at a comparatively high level of competence, and on student programs that reflect individual constellations of diversified interests."

Accordingly, the Swarthmore curriculum requires of the student both a diversity of intellectual experience sufficient to test and develop different capacities and perspectives and concentration on some field(s) sufficiently intensive to develop a serious understanding of problems and methods and a sense of the conditions of mastery. These ends of a liberal education are reflected in requirements for distribution and for the major.

During the first half of their college program all students are expected to satisfy some if not all of the distribution requirements, to choose their major and minor subjects, and to prepare for advanced work in these subjects by taking certain prerequisites. The normal program consists of four courses each semester chosen by the student in consultation with his or her faculty advisor.

The program for upper class students affords a choice between two methods of study: the External Examination (Honors) Program and the Course program. Reading for Honors is characteristically the more intensive, Course work the more diversified. An Honors candidate concentrates on two or three fields, the major and one or more minors; studies are intensive and will occupy three-fourths of the student's working time during the last two years. In addition, the student takes four

courses, or the equivalent, which provide opportunities for further exploration outside the Honors program. At the close of the senior year, the Honors candidate takes a series of six examinations given by visiting examiners.

A student in the Course program has wider freedom of election and normally takes four courses or their equivalent in each of the last four semesters. Before the end of the senior year, students are required to pass a comprehensive examination given by the major department. Students in the Course program are admitted to seminars when space is available; but work in colloquia as well as independent work is part of the Course program.

The program for engineering students follows a similar basic plan, with certain variations which are explained on page 111. Courses outside the technical fields are distributed over all four years.

The course advisors of freshmen and sophomores are members of the faculty appointed by the Dean. For juniors and seniors the advisors are the chairs of their major departments or their representatives.

PROGRAM FOR FRESHMEN AND SOPHOMORES

The curriculum of the first two years introduces a student to the content and methods of a variety of fields important to a liberal education. The College distribution requirements are designed to lead the student into serious work in several different, important, and broadly characteristic kinds of intellectual activity without insisting on a specific or narrow classification of knowledge and inquiry.

To meet these distribution requirements a student must take at least two courses in each of the four subject-matter groups listed below, elect work in at least six departments, and complete at least 20 credits outside the major before graduation. Three of the four distribution groups (those dealing with the natural sciences and engineering, literature and the arts, and the social and policy sciences) correspond generally to the College's grouping of academic departments in three divisions; a fourth group comprises subjects especially relevant to more than one division. Mathematics, though not included in the four groups, may be counted as one of the six departments in which work should be elected. Other courses which will not fulfill a distribution requirement (e.g. courses taught jointly by members of different departments, courses in education) may not be counted as one of the six departments. The distribution requirements are reviewed and revised from time to time by the Faculty as perspectives of disciplines and of departments change and in recognition of the pluralism of intellectual work.

The four groups for the distribution requirement at present are:

1. Astronomy, Biology, Chemistry, Computer Science (except CS 15), Engineering (except Engineering 23), Physics (except Physics 5).
2. Art (courses in art history except Art History 5), Classics (literature courses numbered 11 or above), English Literature (with the exception of English 1A and 1B and workshop and studio courses), Modern Languages (literature courses numbered 11 or above), Music (except courses numbered 40-48 and Dance 1-12 and 40).
3. Classics (Greek 1-2; Latin 1-2; courses in ancient history), History, Linguistics, Modern Languages (courses numbered 1 through 10), Philosophy, Psychology, Religion.
4. Economics (except Economics 3, 5), Political Science, Sociology and Anthropology.

Unless explicitly listed above, courses taught jointly or alternately by faculty members of departments in different distribution groups may not be used to satisfy distribution requirements; and courses cross-listed between departments in two groups fulfill the distribution requirement only for the group in which the offering department belongs.

Students entering college with special preparation in any of the subjects included in the distribution requirements may apply to the Committee on Academic Requirements for exemption from that requirement, but second-

ary school courses of an advanced level do not usually provide grounds for such exemption.

It is most desirable that students include in their programs some work in a foreign language, beyond the basic language requirement (see p. 58). A student who intends to major in one of the natural sciences, mathematics, or engineering should take an appropriate mathematics course in the freshman year. Students intending to major in one of the social sciences should be aware of the increasing importance of mathematical background for these subjects.

In addition to the requirements listed above, prerequisites must be completed for the work of the last two years in major and minor subjects, and sufficient additional electives must be taken to make up a full program, bearing in mind the requirement that at least 20 credits must be taken outside the major department.

Early in the sophomore year, the student should identify two or three subjects as possible majors, paying particular attention to departmental requirements and recommendations.

While faculty advisors assist students in preparing their academic programs, it is emphasized that students themselves are individually responsible for planning and adhering to programs and for the completion of graduation requirements. Faculty advisors, department chairmen, other faculty members, the Deans, and the Registrar are available for information and advice.

In the freshman and sophomore years all students not excused for medical reasons are required to complete a four quarter (two semester) program in physical education. The requirements are stated in full on page 57.

The program for freshmen and sophomores, beginning with the Class of 1990, will change from that described above. Prospective students should contact the Admissions Office for details of these changes.

COURSE PROGRAM FOR JUNIORS AND SENIORS

The work of juniors and seniors in the Course program includes some intensive, specialized study within a general area of interest. This comprises enough work in a single department (designated as a "major") to make an equivalent of at least eight courses before graduation. There is no upper limit to the number of courses a student may take in the major field, provided that at least twenty credits be taken outside the major field. Before graduation the student must pass a comprehensive examination in his or her major subject.

Students must determine a major subject by the end of their sophomore year, and apply formally through the Registrar to be accepted by the department or division concerned. Acceptance will be based upon the student's record and an estimate of his or her capabilities in the designated major. Students who fail to secure approval of a major cannot be admitted to the junior class.

With departmental permission it is possible for a student to plan a Special Major that includes closely related work in one or more departments outside the major department. This work (up to four courses normally) is part of the major program for the comprehensive examination; some of it may consist of a thesis or other written research project(s) designed to integrate the work across departmental boundaries. In any case, the program of the Special Major is expected to be integral in the sense that it specifies a field of learning (not necessarily conventional) or topic or problems for sustained inquiry that crosses departmental boundaries and can be treated as a sub-field within the normal departmental major. Special Majors consist of at least 10 credits and normally of no more than 12 credits. Occasionally, where regular departmental requirements unduly constrain the possibilities of a Special Major, these requirements may be relaxed to a minimum of six courses in the primary department or by the omission of certain courses in that department normally required for the sake of breadth of experience of the major field; but course requirements central to systematic understanding of the major field will not be waived. By extension,

Special Majors may be formulated as joint majors between two departments, normally with at least five credits in each department and 11 in both departments, which, in such programs, collaborate in advising and in the comprehensive examination.

During the junior and senior years, Course students are advised by the chairman of the major department (or a member of the department designated by the chairman) whose approval must be secured for the choice of courses each semester.

The faculty may award the bachelor's degree with Distinction to students who have done distinguished work in the Course program and have achieved the grade average established for this degree.

EXTERNAL EXAMINATION PROGRAM (READING FOR HONORS) FOR JUNIORS AND SENIORS

The External Examination Program, initiated in 1922 by President Frank Aydelotte and modified most recently in 1977, is a distinctive part of Swarthmore's educational life. While the program is designedly flexible and responsive to new needs, it has been characterized from the beginning by three basic elements, which taken together may be said to be the essence of the system.

(1) Reading for Honors involves a concentration of the student's attention during the junior and senior year upon a limited field of studies. Normally, the student pursues only two subjects each semester, avoiding fragmentation of interests. Content of studies is correspondingly broader and deeper, permitting a wide range of reading and investigation and demanding of the student correlations of an independent and searching nature.

(2) While Reading for Honors frees students from periodic examination, it exposes their thinking to continual scrutiny from both classmates and instructors. In this program, students are prepared for examinations in six subjects, given at the close of the senior year. In these, the student is expected to demonstrate competence in a field of knowledge rather than mere mastery of those facts and interpretations which the instructor has presented. These examinations, consisting of a three-hour paper in each field, are set by examiners from other institutions who also come to the campus to conduct an oral examination of each student.

(3) Reading for Honors is customarily carried on in seminars, in independent projects, or in classes which have been approved as preparations for external examinations. Seminars meet once a week, in many cases in the home of the instructor, for sessions lasting three hours or more. The exact technique of the seminar varies with the subject matter, but its essence is a cooperative search for truth, whether it be by papers, discussion, or laboratory experiment. While students preparing for external examinations may under unusual circumstances elect to take as many as eight seminars, an Honors candidate will usually take no more than six seminars; if over six are taken, those six which constitute commitment to be considered for Honors must be designated at the time of entry into the External Examination program. Once a seminar in a designated subject has been taken, the student must stand for the external examination as part of his or her Honors program. Seminars not so designated will be foreclosed from consideration for Honors. Fewer than six seminars may be taken, since it is possible to prepare in other ways for Honors examinations.

In practice three avenues toward an Honors degree are open:

(1) The normal program of reading for Honors consists of six subjects studied during the last two years in preparation for papers, i.e., examinations, given by the visiting examiners at the close of the senior year. The usual pattern is four papers in the major department and two in a minor department, but other combinations of major and minor fields are possible. No student is allowed more than four papers in the major; in those cases where three subjects are offered in each of two fields, one of them is designated as the major. A major includes enough work in a single department to make an equivalent of at least eight courses before graduation. While

there is a general belief that two papers in a minor field are desirable because of the mutual reinforcement they provide, there are by custom certain subjects which are allowed to stand alone. Thus there is a considerable flexibility in Honors programs, each being subject to the scrutiny of the departments and divisions in which the work is done.

(2) Students who have a special reason to study for one or two semesters abroad or in another American institution must take the normal number of examinations. Such programs must be worked out in advance, since it may not be possible to provide special visiting examiners for work taken elsewhere and since instruction in some fields of the student's choice may not be available in the other institution. In general the student following this avenue to an Honors degree should weigh carefully the advantage of working independently or under tutorial guidance against the loss incurred by missing both the stimulus and criticism provided in seminar.

(3) Students who at the end of the sophomore year did not elect or were not permitted to read for Honors, but whose work has subsequently shown distinction, may be encouraged to enter the External Examination program as late as the middle of the senior year. They shall receive no remission of the number of examinations. They must petition the appropriate division before the beginning of the second semester of the senior year for permission to take the external examinations and must submit an acceptable list of examinations which they are prepared to take.

A candidate for admission to the External Examination program should consult the chairmen of his or her prospective major and minor departments during the second semester of the sophomore year and work out a program for the junior and senior years. This proposed program must be filed in the office of the Registrar who will forward it to the divisions concerned. The acceptance of the candidate by the divisions depends in part upon the quality of the student's previous work as indicated by the grades received but mainly upon the student's apparent capacity for assuming the responsibility of reading for Honors. The major department is responsible for the original plan of work and for keeping in touch with the candidate's progress from semester to semester. The division is responsible for approval of the original program and of any later changes in that program.

At the end of the junior year, Honors candidates are required to take the external examinations set at that time for the fields they have studied. These trial papers are read by Swarthmore instructors, not by the visiting examiners. On the basis of the showing made in these examinations, the student may be advised or required to leave the External Examination program. Those students who move to the Course program under these circumstances or for other reasons will receive grades for the work accomplished while reading for Honors, but in no case without taking examinations in the field covered. If a student wishes to reapply at a later date for readmission to the External Examination program, the new program must include all seminars already taken as part of the original approved program (see #3, p. 47).

At the end of the senior year the reading of the examinations and the decision of the degree of Honors to be awarded the candidates is entirely in the hands of the visiting examiners. Upon their recommendation, successful candidates are awarded the Bachelor's Degree with Honors, with High Honors, or with Highest Honors. When the work of a candidate does not in the opinion of the examiners merit Honors of any grade, Swarthmore faculty members review the student's examination papers and assign grades.

EXCEPTIONS TO THE FOUR-YEAR PROGRAM

Although the normal period of uninterrupted work toward the Bachelor of Arts and Bachelor of Science degrees is four years, graduation in three years is freely permitted when a student can take advantage of Advanced Placement credits, perhaps combining them with extra work by special permission. When circumstances warrant, a student may lengthen the

continuous route to graduation to five years by carrying fewer courses than the norm of four: this may be appropriate for students who enter Swarthmore lacking some elements of the usual preparation for college, who are physically handicapped, or who wish to free time for activities relating to their curricular work although not done for academic credit. Such five-year programs are possible in Music and Studio Arts for students who are taking instruction off campus or who wish to pursue studio or instrumental work without full credit but with instruction and critical supervision; but such programs are possible only on application to and selection by the department concerned, which will look for exceptional accomplishment or promise. In all cases where it is proposed to reduce academic credit and lengthen the period before graduation the College looks particularly to personal circumstances and to careful advising and necessarily charges the regular annual tuition (see the provisions for overloads, p. 20). Full-time leaves of absence for a semester or a year or more are freely permitted and in some cases encouraged, subject also to careful planning and academic advising.

NORMAL COURSE LOAD

Although normal progress toward the degree of Bachelor of Arts or Bachelor of Science is made by eight semesters' work of four courses or the equivalent each semester, students may and frequently do vary this by programs of five courses or three courses if it is desirable for them to do so. The object of progress toward the degree is not primarily, however, the mere accumulation of 32 credits. College policy does not permit programs of fewer than three courses within the normal eight semester enrollment. Programs of more than five courses or fewer than four courses require special permission (see p. 20 on tuition and p. 56 on registration).

FORMATS OF INSTRUCTION

While classes and seminars are the normal curricular formats at Swarthmore, faculty regulations encourage other modes as well. These include various forms of individual study, student-run courses, and a limited amount of "practical" or off-campus work.

The principal forms of individual work are attachments to courses, directed reading, and tutorials. The faculty regulation on attachments provides that a student may attach to an existing course, with permission of the instructor, a project of additional reading, research, and writing. If this attachment is taken concurrently with the course it is normally done for half credit. If it is taken in a later semester (preferably the semester immediately following), it may be done for either half or full credit. This kind of work can be done on either a small-group or individual basis. It is not possible in all courses, but it is in most, including some introductory courses. For freshmen and sophomores it is a way of developing capacities for independent work, and for Honors candidates it is an alternative to seminars as a preparation for papers. Students who decide before the middle of the semester to do a half-credit attachment may commonly, with permission, withdraw from a regular course and carry three and a half credits in that term to be balanced by four and a half credits in another term. Students may do as many as two attachments each year.

Directed reading and tutorials are similar; but the faculty role in the former is more bibliographical than pedagogical, and, because they require somewhat less faculty time, opportunities for directed reading are more frequent in most departments than are opportunities for tutorials. In both cases substantial written

work and/or written examinations are considered appropriate, and it is generally desirable that the work be more specialized or more sharply focussed than is usually the case in courses or seminars; the work may range from a course of reading to a specific research project. Such work is available primarily to juniors and seniors in accordance with their curricular interests and as faculty time permits.

The faculty regulation on student-run courses permits a group of students to propose a topic to an instructor for half or single credit and to run their own course with a reading list approved by the instructor and a final examination or equivalent administered by him or her, but normally with no further involvement of faculty. In organizing such a course students obtain provisional approval and agreement to serve as course supervisor from a faculty member by December 1st (for the spring term) or May 1st (for the fall term) on the basis of an initial memorandum emphasizing the principal subject matter to be studied, the questions to be asked about it, the methods of investigation, and providing a preliminary bibliography. The course is then registered by its organizers with the Provost, who has administrative supervision of such work, and who may waive the foregoing deadlines to recognize problems in the organization of such courses. The course supervisor consults his or her department, and in the case of an interdepartmental course, any other department concerned, whose representatives together with the Provost will decide whether to approve the course. The supervisor also reviews the course outline and bibliography and qualifications and general eligibility of students proposing to participate in the course. After a student-run course has been found acceptable by the appropriate department (or departments) and the Provost, the course supervisor's final approval is due ten days before the term begins, following which a revised reading list and class list are given to the Librarian and the course title and class list are filed with the Registrar. At the end of the course the supervisor evaluates and grades the students' work in the usual way or arranges for an outside examiner to do so.

Student-run courses may vary in format and content. In particular, they may be provisionally proposed for half credit to run in the first half of the semester, and at midterm, may be either concluded or, if the participants and course supervisor find the work profitable, continued for the balance of the term for full credit. Alternatively, student-run courses may be started after the beginning of the semester (up to midsemester) for half credit and then be continued, on the same basis, into the following term. Or they may be taken for half credit over a full term. The role of the course supervisor may exceed that in planning and evaluation outlined above and extend to occasional or regular participation. The only essentials, and the purpose of the procedures, are sufficient planning and organization of the course to facilitate focus and penetration. The course planning and organization, both analytical and bibliographical, are also regarded as important ends in themselves, to be emphasized in the review of proposals before approval. Up to four of the 32 credits required for graduation may be taken in student-run courses.

Finally, as to applied or practical work, the College may under faculty regulations grant up to one course credit for practical work, which may be done off campus, when it can be shown to lend itself to intellectual analysis and is likely to contribute to a student's progress in regular course work, and subject to four conditions: (1) agreement of an instructor to supervise the project; (2) sponsorship by the instructor's department, and in the case of an interdisciplinary project, any other department concerned, whose representatives together with the Provost will decide whether to grant permission for the applied or practical work before that work is undertaken; (3) a basis for the project in some prior course work; and (4) normally, the examination of pertinent literature and production of a written report as parts of the project. This option is intended to apply to work in which direct experience of the off-campus world or responsible applications of academic learning or imaginative aspects of the practice of an art are the primary elements. Because such work is likely to bear a loose relation to organized instruction and the regular curriculum, the College limits academic credit for it while recognizing its special importance for some students' programs.

INTERDISCIPLINARY WORK

The requirements of the major typically leave room for significant flexibility in students' programs, both within and outside the major. This may be used to pursue a variety of interests and to emphasize intellectual diversity; it may also be used for the practical integration of individual programs around interests or principles supplementing the major. The College offers interdepartmental majors in Medieval Studies, Literature, and Linguistics-Psychology, and formal interdisciplinary programs short of the major in Asian Studies, Black Studies, Computer Science, International Relations, and Public Policy. The programs in Education and in Linguistics have departmental status as to staff. It should be recognized that some departments are themselves interdisciplinary in nature; that a considerable number of courses are cross-listed between departments; that each year some courses are taught jointly by members of two or more departments; that departments commonly recommend or require supporting work for their major in other departments; and that students can organize their work into personally selected concentrations in addition to or as extensions of their majors, particularly in Special Majors. Such concentration is formally provided in Black Studies, Asian Studies, Computer Science, International Relations, and Public Policy. Many other opportunities exist informally—e.g., in comparative literature, in African studies, in American studies, in religion and sociology-anthropology, in engineering and social sciences, in women's studies, in biochemistry, or in chemical physics. Students are encouraged to seek the advice of faculty members on such possibilities with respect to their particular interests. In some cases faculty members of several departments have planned and scheduled their course offerings with some consultation so as to afford a de facto concentration in addition to the major, and students may wish to know and take advantage of these cases of overlapping faculty interests.

HEALTH SCIENCES ADVISORY PROGRAM

The function of the health sciences advisory program is twofold: to advise students interested in a career in the health sciences, and to prepare letters of recommendation for professional schools to which students apply. The letters are based on faculty evaluations requested by the student, the student's academic record and non-academic activities.

Students intending to enter a career in the health sciences, especially those applying to medical or dental schools, should plan their academic programs carefully to meet the necessary requirements, as well as the general College requirements. The following courses are among the *minimum* requirements for students entering medical or dental schools: Biology 1, 2 (students who have earned advanced placement credit for Biology 1, 2 should take two other biology courses); Chemistry 10, 22, 32, 36; Physics 1, 2, or 3, 4; Math 5 and one additional math course; and English Literature, two semester courses. Students should note the physics and math prerequisites for Chemistry 36 and plan their sequence of courses accordingly. In addition to the minimal requirements, some medical schools require and many recommend the following courses: Cell Biology, Developmental Biology, Genetics, and one year of calculus. However, the student should bear in mind that requirements change, and should remain in touch with those professional schools in which he or she is interested. The work of the junior and senior years may be completed in either the Course or the Honors Program, and in any major department of the student's choice. However, professional schools in the health sciences generally require a demonstrated proficiency in the basic sciences. All required courses should therefore be taken on a graded basis after the first semester of the freshman year.

Almost all medical schools require applicants to take the New Medical College Admission Test which is given in April and September each year. It is recommended that students take the test in the Spring of the year that they apply for

admission to medical schools. The *Student Manual for the New MCAT* should be reviewed as early as practical and may be purchased in the College bookstore. Swarthmore College is a testing center for the New MCAT. Corollary tests, the Dental Aptitude Test and the Veterinary Aptitude Test, are often required by dental and veterinary schools.

Specific requirements for each medical and dental school along with much other useful information are given in two publications which are available in the College bookstore or the Health Sciences Advisory Office: *Medical School Admission Requirements* and *Admission Requirements of American Dental Schools*. Catalogs for most medical and veterinary schools are also on file in the Advisory Office.

The Health Sciences Advisor meets periodically with students interested in health careers and is available to assist students in planning their programs in cooperation with students' own academic advisors. Further information on opportunities, requirements and procedures can be obtained from the Health Sciences Advisor but it is the student's responsibility to make his or her intentions known to the Advisor at the earliest possible date.

CREATIVE ARTS

Work in the creative arts is available both in the curriculum of certain departments and on an extracurricular basis. Interested students should consult the departmental statements in Art, English Literature, and Music. A total of not more than five courses in the creative arts may be counted toward the degrees of Bachelor of Arts and Bachelor of Science.

COOPERATION WITH NEIGHBORING INSTITUTIONS

With the approval of their faculty advisor and the Registrar, students may take a course offered by Bryn Mawr or Haverford College or the University of Pennsylvania without the payment of extra tuition. This arrangement does not apply to the summer sessions of the University of Pennsylvania and Bryn Mawr College.

STUDENT EXCHANGE PROGRAMS

To provide variety and a broadened outlook for interested students, the College has student exchange arrangements with Brandeis University, Howard University, Middlebury College, Mills College, Pomona College, Rice University, and Tufts University. Selection is made by a committee of the home institution from among applicants who will be sophomores or juniors at the time of the exchange. With each institution there is a limited and matched number of exchanges. Students settle financially with the home institution, thus retaining during the exchange any financial aid for which they are eligible. Exchange arrangements do not permit transfer of participants to the institution with which the exchange takes place.

EDUCATION ABROAD

The College recognizes the general educational value of travel and study abroad and cooperates as far as possible in enabling interested students to take advantage of such opportunities. It distinguishes, however, between those foreign study plans which may be taken for credit as part of a Swarthmore educational program, and those which must be regarded as supplemen-

tary. To be acceptable for credit, foreign study must meet Swarthmore academic standards, and must form a coherent part of the student's four-year plan of study. The External Examination (Honors) Program in particular demands a concentration of study which is not easily adapted to the very different educational systems of foreign universities. Therefore, while some of the programs listed below may normally be taken as substitutes for a semester or a year of work at Swarthmore, each case is judged individually, and the College may withhold its approval of a particular program, or may insist that the program be carried out as an extra college year.

Plans for study abroad must be approved in advance by the Registrar and the chairmen of departments concerned, if credit is to be given for courses taken. Students may be asked to take examinations upon their return to the College. Requests for credit must be made within the academic year following return to Swarthmore. Individual departments, such as Art and Modern Languages and Literatures, publish separate instructions for transfer of credits from other institutions. These are available from the respective department offices.

1. *The Swarthmore Program in Grenoble, France,* inaugurated in the fall of 1972. Students entering this program spend either one or two semesters at the University of Grenoble, where their course of study is the equivalent of one or two semesters at Swarthmore. This program, under the auspices of the Department of Modern Languages and Literatures, is open to students from any department, but especially those in the humanities and social sciences. Should there be places available, applications from students at other institutions are accepted. The number of participants in limited to twenty-five.

Students are integrated into the academic life at the University of Grenoble through regular courses, when their language competence allows, or through special courses for foreign students. Individual programs are arranged to suit the needs and competencies of students. Preparation of External Examination papers is possible in certain fields. The program is designed primarily for juniors and second semester sophomores, but seniors can be accommodated in special cases.

A member of the Department of Modern Languages and Literatures acts as resident Director. The Director teaches a course or a seminar, supervises the academic program and the living arrangements of the students, and advises on all educational or personal problems. A coordinator of the program at Swarthmore handles such matters as admissions to the program (in consultation with the Deans), financial aid, transfer of academic credit to departments within the College and to institutions whose students participate in the program. Applications for the fall semester must be submitted by March 15 and for the spring semester by October 15.

2. *Academic Year in Madrid, Spain.* This program is administered by the Romance Language Department of Hamilton College, in cooperation with faculty members of Williams, Mount Holyoke and Swarthmore Colleges. Students many enroll either for the full academic year or for the fall semester only. (Credit at Swarthmore must be obtained through the departments concerned.) The program attempts to take full advantage of the best facilities and teaching staff of the Spanish community, while adhering to the code of intellectual performance characteristic of the most demanding American institutions.

A distinguishing aspect of the program is the individual guidance provided students in non-academic areas, especially in (1) the efforts that are made to find homes well suited for student lodging, and (2) the activities which are planned to insure ample contact with Spanish students.

The program is based in Madrid, where the cultural, educational and geographic benefits are optimum. Classrooms and office space are located at the International Institute (Miguel Angel 8, Madrid). The Institute is centrally located, it houses a library eminently suited for study and research, and it sponsors a series of lectures, concerts and social activities.

The program is under the general guidance of a committee comprised of members of the Hamilton College Department of Romance Languages, who, in rotation with professors from Williams, Mount Holyoke, and Swarthmore Colleges, serve also as directors-in-

residence in Madrid.

Applications and further information are available from the Department of Modern Languages and Literatures.

3. *Swarthmore-supported Programs of Study Abroad.* Swarthmore students may apply their scholarship monies to the cost of participating in one of the programs of academic study abroad listed below, subject to the student's acceptance to the program in question and the customary regulations which apply to study abroad as outlined above.

1) Swarthmore College Program in Grenoble (France) for either semester or the entire academic year (see above);
2) Hamilton College Academic Year in Madrid (Spain) for the fall semester or the entire academic year (see above);
3) Wayne State Junior Year in Germany, either at the University of Freiburg or the University of Munich (West Germany) for the entire academic year;
4) Smith College Junior Year at the University of Hamburg (West Germany) for the entire academic year;
5) Great Lakes College Association Latin America Program (Ceuca) in Bogota (Colombia) for either semester or the entire academic year;
6) The Intercollegiate Center for Classical Studies in Rome (Italy) for either semester or the entire academic year. (See also announcement of the Art Department, p. 67, and of the Classics Department, p. 88.)
7) Sweet Briar Junior Year in France (Paris).
8) Intercollegiate Sri Lanka Educational (ISLE) Program at the University of Peradeniya for the fall (August-November) semester.
9) China Educational Tours program (CET) in Beijing, the People's Republic of China.

Students who wish to apply scholarship funds to the above programs should consult with the Financial Aid officer of the College.

4. *Other Established Programs.* Students who wish to study abroad under formal academic conditions but whose needs would not be met by any of the programs listed above may apply to one of the programs administered by other American colleges and universities; for example, those of Oberlin College, with whose Chinese Studies Program at Tunghai University the College is also affiliated, Smith College, or Sweet Briar College. These are full-year programs of study at foreign universities, under the supervision of American college personnel. Interested students should consult the Associate Provost.

5. *Direct Enrollment.* Application may also be made directly to foreign institutions for admission as a special student. This should be done only after consultation with the Registrar and the appropriate department head. Care must be taken to assure in advance that courses taken abroad will be acceptable for Swarthmore credit. Most foreign universities severely limit the number of students they accept for short periods.

The Olga Lamkert Memorial Fund. Income from a fund established in 1979 by students of Olga Lamkert, Professor of Russian at Swarthmore College from 1949 to 1956, is available to students with demonstrated financial need who wish to attend a Russian summer school program in this country or either the Leningrad or Moscow semester programs in the USSR. Awards based on merit and financial need will be made on the recommendation of the Russian section of the Department of Modern Languages and Literatures.

Faculty Regulations

ATTENDANCE AT CLASSES

Registration to take a course for credit implies regular attendance at classes, unless a student specifically elects to obtain credit in a course without attending classes. The conditions for exercising this option are set forth below. With this exception, students are responsible for regular attendance. Faculty members will report to the Dean the name of any student whose repeated absence is in their opinion impairing the student's work. The number of cuts allowed in a given course is not specified, a fact which places a heavy responsibility on all students to make sure that their work is not suffering as a result of absences. Since freshmen must exercise particular care in this respect, and since the Faculty recognizes its greater responsibility toward freshmen in the matter of class attendance, it is expected that freshmen, especially, will attend *all* classes.

When illness necessitates absence from classes, the student should report at once to the Health Center.

A student may obtain credit for a course without attending class meetings by reading the material prescribed by a syllabus and taking a final examination, under the following conditions:

1) The student must signify intent to do so at the time of registration, having obtained the instructor's approval in advance.

2) If after such registration the student wishes to resume normal class attendance, the instructor's approval must be obtained.

3) The student may be required to perform such work, in addition to the final examination, as the instructor deems necessary for adequate evaluation of his or her performance.

4) The final grade will be recorded by the Registrar exactly as if the student had attended classes normally.

GRADES

Instructors report to the Dean's and Registrar's offices at intervals during the year upon the work of students in courses. Informal reports during the semester take the form of comments on unsatisfactory work. At the end of each semester formal grades are given in each course under the letter system, by which *A* means excellent work, *B* good work, *C* satisfactory work, *D* passing but below the average required for graduation, and *NC* (no credit) for uncompleted or unsatisfactory work. Letter grades are qualified by pluses and minuses. *W* signifies that the student has been permitted to withdraw from the course by the Committee on Academic Requirements. *X* designates a condition; this means that a student has done unsatisfactory work in the first half of a year course, but by creditable work during the second half may earn a passing grade for the full course and thereby remove the condition. *R* is used to designate an auditor or to indicate cases in which the work of a foreign student cannot be evaluated because of deficiencies in English.

Inc. means that a student's work is incomplete with respect to specific assignments or examinations. The Faculty has voted that a student's final grade in a course should incorporate a zero for any part of the course not completed by the date of the final examination, or the end of the examination period. However, if circumstances beyond the student's control preclude the completion of the work by this date, a grade of *Incomplete (Inc.)* may be assigned with the permission of the Registrar. In such cases incomplete work must normally be made up and graded and the final grade recorded within five weeks after the start of the following term. Except by special permission of the Registrar (on consultation with the Committee on Academic Requirements) all grades of *Inc.* still outstanding after that date will be replaced on the student's permanent record by *NC* (no credit). Waiver of this provision by special permission shall in no case extend beyond one year from the time the *Inc.* grade was incurred.

The only grades recorded on students' records for courses taken during their first semester of the freshman year are *CR* (credit) and *NC* (no

credit). In the balance of their work at Swarthmore, students may select up to four courses for Credit/No Credit by informing the Registrar's Office within the first two weeks of the term in which the course is taken, except that repeated courses may not be taken Credit/No Credit. For freshmen and sophomores *CR* will be recorded for work that would earn a grade of *D* or higher; for juniors and seniors the minimum equivalent letter grade for *CR* will be *C*. Instructors are asked to provide the student and the faculty adviser with evaluation of the student's Credit/No Credit work. The evaluation for first-semester freshmen includes a letter-grade equivalent; for other students the evaluation may be either a letter-grade equivalent, or a comment. Such evaluations are not a part of the student's grade record. Letter grade equivalents only, for first semester freshmen courses only, may be provided to other institutions if requested by the student and absolutely required by the other institution.

Reports of grades are sent to students at the end of each semester. They are not routinely sent to parents or guardians, but such information may be released when students request it.

A C (2.0) average is required in the courses counted for graduation.

REGISTRATION

All students are required to register and enroll at the time specified in official announcements and to file programs of courses or seminars approved by their faculty advisors. Fines are imposed for late or incomplete registration or enrollment.

A regular student is expected to take the prescribed number of courses in each semester. If more than five or fewer than four courses seem desirable, the faculty advisor should be consulted and a petition filed with the Committee on Academic Requirements.

Applications involving late entrance into a course must be received within the first two weeks of the semester. Applications involving withdrawal from a course must be received not later than the middle of the semester, or the mid-point of the course if it meets for only one-half a semester.

A deposit of $100 is required of all returning students prior to their registration in both the spring and fall semesters. This deposit is applied to charges for the semester, and is not refundable.

EXAMINATIONS

Any student who is absent from an examination, announcement of which was made in advance, shall be given an examination at another hour only by special arrangement with the instructor in charge of the course.

No examination in absentia shall be permitted. This rule shall be interpreted to mean that instructors shall give examinations only at the College and under direct departmental supervision.

ACADEMIC HONESTY

Members of an academic community have an unequivocal responsibility to present as the result of their own work only that which is truly theirs. Cheating, whether in examinations or by plagiarizing the work of others, is a most serious offense, and one which strikes at the foundations of academic life.

The responsibility of the Faculty in this area is three-fold: to explain the nature of the problem to those they teach (the Faculty's statement concerning plagiarism may be found in *The Student Handbook*), to minimize temptation, and to report any case of cheating to the Dean for action by the College Judiciary Committee.

The College Judiciary Committee will consider the case, determine guilt, and recommend a penalty to the President. The order of magnitude of the penalty should reflect the seriousness of the transgression. It is the opinion of the Faculty that for the first offense failure in the course and, as appropriate, suspension for a semester or deprivation of the degree in that year is not unsuitable; for a second offense the penalty should normally be expulsion. A full description of College judicial procedure may be obtained from the office of the Dean.

STUDENT LEAVES OF ABSENCE

Student leaves of absence are freely permitted provided the request for leave is received by the date of enrollment and the student is in good standing. If a student has not enrolled and has not arranged for a leave of absence for the subsequent semester, it is assumed that he or she is withdrawing. Such students must apply to the Dean for re-admission in order to return to College after an interval. The purpose of this policy is to assist the College in planning its enrollments.

SUMMER SCHOOL WORK

Students desiring to receive Swarthmore College credit for work at a summer school are required to obtain the approval of the chairman of the Swarthmore department concerned before doing the work. Prior approval is not automatic: it depends upon adequate information about the content and instruction of the work to be undertaken. Validation of the work for credit depends upon evaluation of the materials of the course including syllabus, reading lists, written papers, and examinations, by the Swarthmore department concerned after the work has been done. Validation may include an examination, written or oral, administered at Swarthmore. An official transcript from the summer school must be presented to the Office of the Registrar before the work can be validated for credit. Requests for credit must be made within the academic year following the term in which the course is taken. One course credit at Swarthmore is regarded as equivalent to 4 semester hours.

PHYSICAL EDUCATION

In the freshman and sophomore years all non-veteran students not excused for medical reasons are required to complete a four quarter (two semester) program in physical education. All students must pass a survival swimming test or take up to one quarter of swimming instruction. (See the departmental statement of the Department of Physical Education and Athletics.) Students who have not fulfilled their Physical Education requirement will not be allowed to enter their junior year.

EXCLUSION FROM COLLEGE

The College reserves the right to exclude at any time students whose academic standing it regards as unsatisfactory, and without assigning any further reason therefor; and neither the College nor any of its officers shall be under any liability whatsoever for such exclusion.

WITHDRAWAL AND READMISSION FOR HEALTH REASONS

(see p. 36)

Degree Requirements

BACHELOR OF ARTS AND BACHELOR OF SCIENCE

The degree of Bachelor of Arts or Bachelor of Science is conferred upon students who have met the following requirements for graduation. The candidate must have:

1. Completed thirty-two courses or their equivalent.

2. An average grade of C in the courses counted for graduation.*

3. Complied with the distribution requirements and have completed at least twenty credits outside the major. (See pages 45-46.)

4. Beginning with the Class of 1987, either: a) passed at least three years' study of one foreign language while in high school; or, b) achieved a score of 600 or its equivalent in a foreign language on a standard achievement test; or, c) passed one year of a foreign language while at Swarthmore.

5. Met the requirements in the major and supporting fields during the last two years.

6. Passed satisfactorily the comprehensive examinations in his or her major field, or met the standards set by visiting examiners for a degree with Honors.

7. Completed four semesters of study at Swarthmore College, two of which have been those of the senior year.

8. Completed the physical education requirement set forth on page 41 and in statements of the Department of Physical Education and Athletics.

9. Paid all outstanding bills and returned all equipment and library books.

MASTER OF ARTS AND MASTER OF SCIENCE

The degree of Master of Arts or Master of Science may be conferred subject to the following requirements:

Only students who have completed the work for the Bachelor's degree with some distinction, either at Swarthmore or at another institution of satisfactory standing, shall be admitted as candidates for the Master's degree at Swarthmore.

The candidate's record and a detailed program setting forth the aim of the work to be pursued shall be submitted, with a recommendation from the department or departments concerned, to the Curriculum Committee. If accepted by the Committee, the candidate's name shall be reported to the faculty at or before the first faculty meeting of the year in which the candidate is to begin work.

The requirements for the Master's degree shall include the equivalent of a full year's work of graduate character. This work may be done in courses, seminars, reading courses, regular conferences with members of the faculty, or research. The work may be done in one department or in two related departments.

A candidate for the Master's degree shall be required to pass an examination conducted by the department or departments in which the work was done. The candidate shall be examined by outside examiners, provided that where this procedure is not practicable, exceptions may be made by the Curriculum Committee. The department or departments concerned, on the basis of the reports of the outside examiners, together with the reports of the student's resident instructors, shall make recommendations to the faculty for the award of the degree.

At the option of the department or departments concerned, a thesis may be required as part of the work for the degree.

*"An average of C" is interpreted for this purpose as being a numerical average of at least 2.0 (A+, A = 4.0, A– = 3.67, B+ = 3.33, B = 3.0, B– = 2.67, C+ = 2.33, C = 2.0, C– = 1.67, D+ = 1.33, D = 1.0, D– = 0.67). Grades of Credit/No Credit and grades on the record for work not taken at Swarthmore College are not included in computing this average.

A candidate for the Master's degree will be expected to show before admission to candidacy a competence in those languages deemed by his or her department or departments most essential for the field of research. Detailed language requirements will be indicated in the announcements of departments which admit candidates for the degree.

The tuition fee for graduate students who are candidates for the Master's degree is $10,080.

Awards and Prizes

The Ivy Award is made by the Faculty each year to the man of the graduating class who is outstanding in leadership, scholarship, and contributions to the College community.

The Oak Leaf Award is made by the Faculty each year to the woman of the graduating class who is outstanding in leadership, scholarship, and contributions to the College community.

The McCabe Engineering Award, founded by Thomas B. McCabe, 1915, is presented each year to the outstanding engineering student in the Senior Class. The recipient is chosen by a committee of the faculty of the department of Engineering.

The Flack Achievement Award, presented by the Flack Foundation, one of whose founders is Hertha Eisenmenger Flack of the Class of 1938, is made to a deserving student who, during the first two years at Swarthmore College, has demonstrated a good record of achievements in both academic and extracurricular activities while showing leadership potential as a constructive member of the College. The donor hopes these awards will go to students of demonstrated achievement and high potential who are dedicated to the basic principles of American democracy and of academic freedom. The awards are not related to need.

The Academy of American Poets awards $100 each year for the prize poem (or group of poems) submitted in a competition under the direction of the Department of English Literature.

The Adams Prize of $100 is awarded each year by the Department of Economics for the best paper submitted in quantitative economics.

The Stanley Adamson Prize in Chemistry is endowed in memory of Stanley D. Adamson '65 by his parents, June and George Adamson. It is awarded each spring to a well-rounded Junior majoring in Chemistry or Biochemistry who, in the opinion of the Department, gives most promise of excellence and dedication in the field.

The Jonathan Leigh Altman Scholarship, given in memory of this member of the Class of 1974 by Shing-mei P. Altman '76, is awarded to a junior who has a strong interest in the studio arts. It is held during the senior year. The recipient may apply for up to $2,000 for a fellowship in art to be carried out during the summer between the junior and senior year, with the balance of funds available to be used during the academic year, or postgraduately.

American Chemical Society Award is given to the student who is judged by the Department of Chemistry to have the best performance in chemistry and overall academic achievement.

American Institute of Chemists Award is given to the student who is judged by the Department of Chemistry to have the second best record in chemistry and overall academic performance.

The Boyd Barnard Award is awarded annually to one or more students, selected by the Department of Music, in recognition of musical excellence and achievement.

The Paul H. Beik Prize in History of $100 to be awarded each May for the best thesis or extended paper on a historical subject by a History major during the previous academic year.

The Brand Blanshard Prize, honoring Brand Blanshard, Professor of Philosophy at Swarthmore from 1925 to 1945, has been established by David H. Scull, of the Class of 1936. The award of $100 is presented annually to the student who, in the opinion of the Department, submits the best essay on any philosophical topic.

The William and Sophie Bramson Prize in Sociology and Anthropology is awarded each year on the basis of outstanding academic performance, with special emphasis placed upon senior thesis.

The Heinrich W. Brinkmann Mathematics Prize, honoring Hienrich Brinkmann, Professor of Mathematics, 1933-1969, was established by his students in 1978 in honor of his 80th birthday. Two awards of $100 each are to be presented annually to a Course student and Honors candidate who, in the opinion of the Mathematics Department, have demonstrated excellence in Mathematics.

The Sarah Kaighn Cooper Scholarship, founded by Sallie K. Johnson in memory of her grandparents, Sarah Kaighn and Sarah Cooper, is awarded to the member of the Junior Class who is judged by the faculty to have had, since entering College, the best record for scholarship, character, and influence.

The Alice L. Crossley Prize in Asian Studies of $100 is awarded to the student who, in the opinion of the Asian Studies Committee, submits the best essay on any topic in Asian Studies.

The Dorothy Ditter Gondos Award, bequeathed by Victor Gondos, Jr., in honor of his wife, Class of 1930, is given every other year to a student of Swarthmore College who, in the opinion of a faculty committee, submits the best paper on the subject dealing with a literature of a foreign language. The prize of about $100 is awarded in the spring semester. Awarding of the prize will be under the direction of the Literature Committee.

The John Russell Hayes Poetry Prizes are offered for the best original poem or for a translation from any language.

The Philip M. Hicks Prizes are endowed by friends of Philip M. Hicks, former Professor of English and Chairman of the Department of English Literature. They are awarded to the two students who in the opinion of the Department submit the best critical essay on any topic in the field of literature.

The Jesse H. Holmes Prize in Religion of $100, donated by Eleanor S. Clarke of the Class of 1918 and named in honor of Jesse Holmes, Professor of History of Religion and Philosophy at Swarthmore from 1899 to 1934, is awarded to the student who, in the opinion of the Department of Religion, submits the best essay on any topic in the field of religion.

The Kwink Trophy, first awarded in 1951 by the campus managerial organization known as the Society of Kwink, is presented by the faculty of the Department of Physical Education and Athletics to the senior man who best exemplifies the Society's five principles: Service, Spirit, Scholarship, Society, and Sportsmanship.

The Leo M. Leva Memorial Prize, established by his family and friends, is awarded by the Biology Department to a graduating senior whose major is Biology and whose work in the field shows unusual promise.

The Ella Frances Bunting Extemporary Speaking Fund and the *Owen Moon Fund* provide income for a poetry reading contest as well as funds for visiting poets and writers.

The Lois Morrell Poetry Award, given by her parents in memory of Lois Morrel of the Class of 1946, goes to that student who, in the opinion of the faculty, submits the best original poem in the annual competition for the award. The award of $100 is made in the spring of the year.

The A. Edward Newton Library Prize of $50, endowed by A. Edward Newton, to make permanent the Library Prize first established by W.W. Thayer, is awarded annually to that undergraduate who, in the opinion of the Committee of Award, shows the best and most intelligently chosen collection of books upon any subject. Particular emphasis is laid not merely upon the size of the collection but also upon the skill with which the books are selected and upon the owner's knowledge of their subject-matter.

The May E. Parry Memorial Award, donated by the Class of 1925 of which she was a member, is presented by the faculty of the Department of Physical Education and Athletics to the senior woman who by her loyalty, sportsmanship, and skill in athletics has made a valuable contribution to Swarthmore College.

The Drew Pearson Prize of $100 is awarded by the editors of *The Phoenix* at the end of each staff academic year to a member of *The Phoenix* for excellence in journalism. The prize was established by the directors of The Drew Pearson Foundation in memory of Drew Pearson, Class of 1919.

The John W. Perdue Memorial Prize, established in 1969 in memory of an engineering student of the Class of 1969, is awarded by the Department of Engineering to the outstanding student entering the junior class with a major in engineering.

The William Plumer Potter Public Speaking Fund, established in 1927, in addition to providing funds for the collection of recorded literature described on page 14, sponsors awards for the best student short stories, and is a major source of funds for campus appearances by poets and writers.

Judith Polgar Ruchkin Prize Essay is an award for a paper on politics or public policy written during the junior or senior year. The paper may be in satisfaction of a course, a seminar, or an independent project, including a thesis. The paper is nominated by a faculty member and

judged by a committee of the Department of Political Science to be of outstanding merit based upon originality, power of analysis and written exposition, and depth of understanding of goals as well as technique.

The Peter Gram Swing Prize of $1,000 is awarded each year at commencement to an outstanding student whose plans for graduate study in music indicate special promise and need. The endowment for the prize was established in the name of Ruth Cross Barnard '19.

The Melvin B. Troy Award of $250 is given each year for the best, most insightful paper in Music or Dance, or composition or choreography by a student, judged by the Department of Music and Dance. The prize was established by the family and friends of Melvin B. Troy, Class of 1948.

FACULTY AWARD

The Flack Faculty Award is given for excellence in teaching and promise in scholarly activity to a member of the Swarthmore Faculty, to help meet the expenses of a full year of leave devoted to research and self-improvement. This award acknowledges the particularly strong link that exists at Swarthmore between teaching and original scholarly work. The award itself is to be made by the President upon the recommendation of the Provost and the candidate's academic department. This award is made possible by an endowment established by James M. Flack and Hertha Eisenmenger Flack '38.

Fellowships

Three fellowships (the *Leedom, Lippincott,* and *Lockwood* Fellowships—see below) are awarded annually by the Faculty, and two fellowships (the *Mott* and *Tyson* Fellowships—see below) are awarded by the Somerville Literary Society, to seniors or graduates of the College for the pursuit of advanced work. These awards are made on recommendation of the Committee on Fellowships and Prizes for a proposed program of study which has the approval of the Faculty. Applications must be in the hands of the Committee by March 31. The Committee considers applicants for all of these fellowships for which they are eligible and makes recommendations which overall do not discriminate on the basis of sex. These fellowships are:

The Hannah A. Leedom Fellowship founded by the bequest of Hannah A. Leedom.

The Joshua Lippincott Fellowship founded by Howard W. Lippincott, of the Class of 1875, in memory of his father.

The John Lockwood Memorial Fellowship, founded by the bequest of Lydia A. Lockwood, New York, in memory of her brother, John Lockwood. It was the wish of the donor that the fellowship be awarded to a member of the Society of Friends.

The Lucretia Mott Fellowship, founded by the Somerville Literary Society and sustained by the contributions of Swarthmore alumnae. It is awarded each year to a woman senior who is to pursue advanced study in an institution approved by the Committee.

The Martha E. Tyson Fellowship, founded by the Somerville Literary Society in 1913 and sustained by the contributions of Swarthmore alumnae. It is awarded each year to a woman senior or graduate who plans to enter elementary or secondary school work. The recipient of the award is to pursue a course of study in an institution approved by the Committee.

Other fellowships are awarded under the conditions described below:

Susan P. Cobbs Prize Fellowship, established to honor the memory of Dean Susan P. Cobbs, is awarded at the discretion of the Classics Department to a student majoring in Classics for study in Greece or Italy.

The General Electric Foundation Graduate Fellowship, to be awarded to a graduating senior for the first year of graduate work, is intended to encourage outstanding scholars to pursue an academic career. The recipient, who must be a United States citizen or permanent resident, will receive the amount necessary to cover tuition, fees, and subsistence allowance for study directed toward a PhD in Engineering or Computer Science at another institution in the United States. The precise amount of each fellowship will be based on the costs and policies of the university and department chosen for graduate work.

The Elizabeth Pollard Fetter String Quartet Scholarships, endowed by Frank W. Fetter '20, Robert Fetter '53, Thomas Fetter '56 and Ellen Fetter Gille in memory of Elizabeth P. Fetter '25, subsidize the private instrumental lessons of four top-notch student string players at the College. Interested applicants should write to the Chairman of the Department of Music and should plan to play an audition at the College when coming for an interview.

Friends of Music and Dance Summer Fellowships provide stipends for attendance at summer workshops in music and dance. Recipients are selected by the Department of Music and Dance on the basis of written proposals.

Phi Beta Kappa Fellowship. The Swarthmore Chapter of Phi Beta Kappa (Epsilon of Pennsylvania) awards a Fellowship for graduate study to a senior who has been elected to Phi Beta Kappa and has been admitted to a program of advanced study in some branch of the liberal arts.

The Eugene M. Lang Graduate Incentive Fellowship. All Eugene M. Lang senior Scholars who have completed their Opportunity Project (see Financial Aid) and who have academic achievement at Swarthmore sufficient to earn Distinction or Honors may apply for these fellowships. Applicants should submit to the Committee on Fellowships and Prizes a plan of graduate study with high potential for service to society. This fellowship is made possible by the gift of Eugene M. Lang '38.

The Thomas B. McCabe, Jr. and Yvonne Motley McCabe Memorial Fellowship. This Fellowship, awarded annually to a graduate of the College, provides a grant toward the first year of study at the Harvard Business School. Yvonne and Thomas B. McCabe, Jr., were for a time

residents of Cambridge, Massachusetts, and Mr. McCabe received the M.B.A. from Harvard and was a Visiting Lecturer there. In selecting the recipient, the Committee on Fellowships and Prizes follows the standards that determine the McCabe Achievement Awards, giving special consideration to applicants who have demonstrated superior qualities of leadership. Young alumni and graduating seniors are eligible to apply.

The J. Roland Pennock Undergraduate Fellowship in Public Affairs. The Fellowship, endowed by friends of Professor J. Roland Pennnock at his retirement in 1976 and in recognition of his many years of distinguished teaching of Political Science at Swarthmore, provides a grant for as much as $2,500 to support a substantial research project (which could include inquiry through responsible participation) in public affairs. The Fellowship, for Swarthmore undergraduates, would normally be held off-campus during the summer. Preference is given to applicants from the Junior Class.

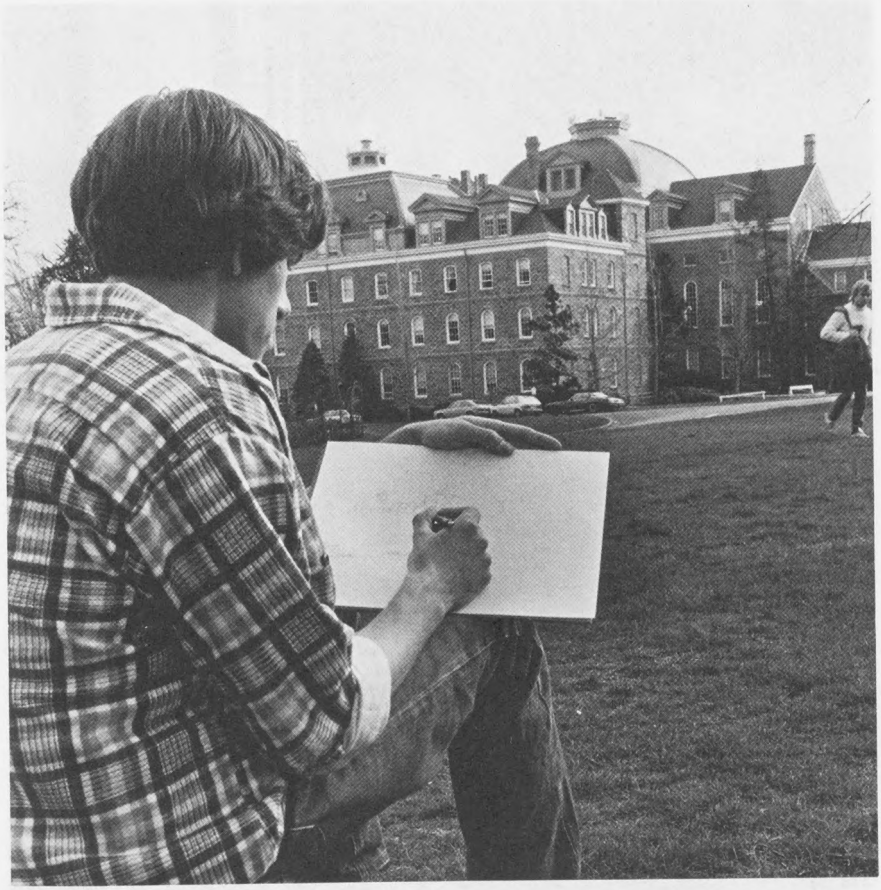
FACULTY FELLOWSHIP

The Eugene M. Lang Faculty Fellowship is designed to enhance the educational program of Swarthmore College by contributing to faculty development, by promoting original or innovative scholarly achievement of faculty members, and by encouraging the use of such achievements to stimulate intellectual exchange among scholars. The Fellowship will provide financial support for faculty leaves through a grant of about one half the recipient's salary during the grant year. Upon recommendation of the Selection Committee, there may be a small additional grant for travel and project expenses and for library book purchases. The Selection Committee shall consist of the Provost, three Divisional Chairmen, and three other persons selected by the President, of whom at least two must be Swarthmore alumni. Any faculty member eligible for leave may apply, and up to four may be chosen. Fellows will be expected to prepare a paper or papers resulting from the work of their leave year, presented publicly for the College and wider community. The Selection Committee may support wholly or in part the cost of publishing any of these papers. These fellowships are made possible by an endowment established by Eugene M. Lang '38.

The Brand Blanshard Faculty Fellowship is an endowed Faculty fellowship in the humanities established in the name of philosopher and former faculty member Brand Blanshard. Blanshard taught philosophy at Swarthmore from 1925 to 1944. The Fellowship will provide a semester leave at full pay for a member of the humanities faculty to do research and to write. Upon recommendation of the Selection Committee, there may be a small additional grant for travel and project expenses. Any humanities faculty member eligible for leave may apply. Fellows will prepare a paper about the work of their leave year and present it publicly to the College and wider community. The Blanshard Fellowship is made possible by an anonymous donor who was Blanshard's student at Swarthmore, and a challenge grant from the National Endowment for the Humanities.

V

Courses of Instruction



The course (semester course) is the unit of credit. Seminars and colloquia are usually given for double credit, i.e., equivalent to two courses. A few courses are given for half-course credit.

Courses are numbered as follows:

1 to 10 — introductory courses
11 to 99 — other courses (Some of these courses are not open to freshmen and sophomores.)
100 to 199 — seminars for Honors candidates and graduate students.

Year courses, the number of which are joined by a hyphen (e.g., 1-2) must be continued for the entire year; credit is not given for the first semester's work only, nor is credit given for the first semester if the student fails the second semester.

Although the course listings in this catalogue cannot be guaranteed as accurate, these are intended to facilitate planning by representing probable offerings over a two-year period. Those courses actually offered each semester are listed in the schedule of classes available before enrollment for that semester.

Art

T. KAORI KITAO, Professor
MICHAEL W. COTHREN, Associate Professor[3]
CONSTANCE CAIN HUNGERFORD, Associate Professor and Chairman
BRIAN A. MEUNIER, Associate Professor
SARAH E. BASSETT, Assistant Professor[4]
BETSEY A. BATCHELOR, Assistant Professor
CURTIS HANSMAN BRIZENDINE, Assistant Professor
RANDALL L. EXON, Assistant Professor[3]
JOYCE J. NAGATA, Assistant Professor (part-time)[2]

The Department of Art offers historical, critical, and practical instruction in the visual arts. Courses in art history consider questions having to do with the forms, traditions, meaning, and historical context of works of art and architecture; studio arts courses explore problems of methods, processes, and personal resources which arise in the actual creation of objects in various media.

Wilcox Gallery: The Florence Wilcox Art Gallery, located in Room 303, Beardsley Hall, provides seven to nine exhibitions a year, which are an integral part of the Studio Arts Program. The works of nationally known artists as well as those of younger artists, in various media, are exhibited in group and one-person shows. Randall Exon is in charge of the Gallery.

Heilman Artist: Each year the Department of Art, in cooperation with the majors in art, selects an artist to visit the College to serve as a visiting artist and critic under the Marjorie Heilman Visiting Artist Program. The work of the invited artist is exhibited in the Wilcox Art Gallery in Beardsley Hall; he or she gives critiques in the studios and also meets and talks with students, both majors and non-majors, on an informal basis.

Lee Frank Lecture: See p. 13.

Benjamin West Lecture: See p. 13.

Jonathan Leigh Altman Scholarship: See p. 23.

Jonathan Leigh Altman Summer Grant: See p. 60.

Study Abroad: Swarthmore is one of the institutions sponsoring the Intercollegiate Center for Classical Studies in Rome, which provides facilities also for the study of Art History. Art majors, recommended by the Department, are eligible to study at the Center during their junior year, for one semester or two.

REQUIREMENTS AND RECOMMENDATIONS

Prerequisites: ARTH 1 or 2 is the prerequisite for all other art history courses in the Department, unless otherwise noted. It is strongly recommended that the appropriate segment of Introduction be taken before an advanced course in a particular subject. STUA 1 is the usual prerequisite for studio arts courses; it may be waived by presenting a portfolio. All majors and minors must take ARTH 1 and 2; in addition, majors in the External Examination and Course Programs alike must take one studio course. It is strongly recommended that these requirements be fulfilled before the junior year. Students are also advised that graduate work in art history requires a reading knowledge of at least German and French.

Course Majors in Art History: The program consists of at least eight courses in Art History (including ARTH 1 and 2), plus one Studio

2 Absent on leave, spring semester, 1986.
3 Absent on leave, 1985-86.
4 Fall semester, 1985.

Arts course and Theory and Methodology (ARTH 97, required for graduation). The comprehensive consists of a lengthy examination, in preparation for which students are required (1) to study a group of carefully chosen works of art and (2) to prepare a list of essay questions on broad topics. Contingent on departmental approval, a two-credit thesis in the fall semester of the senior year may be substituted for Theory and Methodology and the comprehensive examination. The Course major in Art History is required to take at least one course (at Swarthmore) from each of the four core groups: (a) Ancient and Medieval Art—courses 12, 13, 15, 16, and 17; (b) Renaissance and Baroque Art—courses 20, 23, 25, 26, and 28; and (c) Modern Art—courses 30 (only if preceded by ARTH 1 or 2), 32, and 35; and (d) Non-Western Art—courses 29, 45, 46, 47, 48, 49, and 91. Course majors may take Seminars with the consent of the instructor; these also fulfill core requirements.

Course Majors in Art: The combined program of the Course Major in Art consists of a minimum of five courses in Art History, including ARTH 1 and 2, and at least one course in a period before 1800; and five courses in Studio Arts including Drawing and one course in a 3-D medium for 2-D specialist and vice versa. In lieu of an examination, the Comprehensive, consisting of a Senior Exhibition and Catalog, is a requirement for graduation.

Majors and Minors in The External Examination Program: In addition to ARTH 1 and 2 (and one studio course for majors), majors in the External Examination Program should take four seminars in the Department; minors should take two. A corresponding course with an attachment may be substituted for a seminar if that seminar will not be offered during the period of the student's preparation for External Examinations.

Art History

1. Introduction to Art History, I.

A critical and historical introduction to the study of architecture, sculpture, and painting in the East and the West to the fourteenth century. Two lectures and one hour conference section per week.
Fall semester. Bassett and Brizendine.

2. Introduction to Art History, II.

A survey of art and architecture in the East and the West from the fourteenth century to the present. ARTH 1 is not required for ARTH 2 but is strongly recommended. Two lectures and one hour conference section per week.
Spring Semester. Brizendine, Kitao, and Hungerford.

5. Computing from the User's End.

(Also listed as Physics 5.)
This course provides an introduction to, and immediate use of, a wide range of computing functions. No previous experience in computer is necessary. Lectures are one hour per week and supervised workshop sessions are two hours per week. Workshop emphasizing text processing for students in the humanities. Computing topics introduced are: text and file creation and editing, runoff, simple programming techniques, statistical packages, bibliographic search, and data base handling. ½ unit.
Not offered 1985-86. Kitao and Boccio.

12. Greek Art.

The art, architecture and archaeology of ancient Greece from the Minoan period through the Hellenistic age.
Not offered 1985-86.

13. Roman Art.

A survey of the art of the Italian peninsula before the ascendancy of the Roman imperium and the subsequent spread of Roman art throughout the empire to the establishment of tetrarchic rule at the end of the third century. Special attention will be given to the relationship between the social order and artistic production.
Not offered 1985-86. Cothren.

15. Early Christian and Byzantine Art.

An examination of the emergence of a Christian form of artistic expression from the heritage of late antique art, followed by a survey of its international development through the sixth century and its progression in the Byzantine empire centered in Constantinople

until the fall of that empire to the Ottoman Turks in 1453. Attention will be given to architecture, its monumental mosaic and fresco decoration, manuscript illumination, iconic devotional images, and the small-scale arts of ivory carving, metalwork, and enamels.
Fall semester. Bassett.

16. Early Medieval Art in the West.

A survey of the art and architecture of Western Europe from the migration of the barbarian tribes through the establishment of a mature Romanesque style in the twelfth century. The political implications of the Carolingian revival of the classical heritage, monasticism and art, the Book of Kells and Celtic tradition, apocalyptic anxiety around the year 1000, and Romanesque sculpture as ecclesiastical propaganda.
Not offered 1985-86. Cothren.

17. Gothic Art.

The course will emphasize the formation of Gothic art around the year 1140 and its development and codification in France during the thirteenth century. Topics will include the role of Abbot Suger's Neoplatonism in the establishment of a Gothic aesthetic, Saint Louis' "court style" as a statement of political ideology, the inspiration for and effectiveness of structural systems in Gothic architecture, and Gothic humanism around the year 1200. Architecture, sculpture, stained glass, and manuscript illustration will be considered.
Not offered 1985-86. Cothren.

20. Northern Painting.

Painting and printmaking in the Netherlands and Germany from the 14th century through the 16th century with special emphasis on the art of Robert Campin, Jan van Eyck, Rogier van der Weyden, Hieronymus Bosch, Albrecht Durer, and Pieter Breughel. Issues to be considered include the development of the altarpiece (formally and contextually), attitude toward realism, the rise of patronage systems, and the effect of the reformation on subject matter.
Spring semester. Brizendine.

23. Rembrandt and His Times.

Study of Rembrandt's art, especially toward the understanding of the nature of picture making. Works in painting, drawing, and etching are examined. Topics considered include Holland's mercantile and Protestant milieu, Rembrandt's relation to Italy, his Dutch contemporaries, the development of the genres, the print as a medium, the loose style, optics and painting, popular imagery, and, above all, the general questions concerning portraiture, self-portraiture, theatricality, realism, narrative art, landscape, marketing, and the late style.
Spring semester. Kitao.

25. Italian Renaissance Art.

Study of the emergence of a new style in Florence and its development during the period 1390-1440 and after. Topics discussed include humanism in art, historicism, scientific method, secularization, and the artist's role in society. Offered alternately with ARTH 26.
Not offered 1985-86.

26. Michelangelo and His Times.

Michelangelo's art, architecture, poetry, and artistic theory in relation to his Quattrocento predecessors and High Renaissance contemporaries. Topics include classicism, art as problem-solving, definition of genius, the idea of the canon in art, the rise of art criticism, and Mannerism.
Not offered 1985-86. Kitao.

28. Baroque Art.

European art of the 17th century. Special problems considered include: the impact of the Catholic Reformation on art and artists, the question of reality and illusion, the nature of allegory and propaganda in art, the rise of academies and the art market, and the spread of the Baroque style through the Low Countries, France, and Spain. Artists considered include Caravaggio, Bernini, Velazquez, Poussin, Rubens, and Rembrandt.
Not offered 1985-86. Kitao.

29. Arts of Africa.

A historical survey, this course explores African political, religious, and social systems of different epochs through the visual arts. The purpose is to define the role of art in a traditional African context. Topics include arts of leadership, arts of divination, funerary arts, rites of passage, and masquerade as total art. Emphasis is placed on the relationship between social structure, artistic expression, and symbolic thought. Also considered are the role of the artist in African society, the aesthetic values of different cultures, canons of form, and stylistic change. No prerequisite.
Not offered 1985-86.

30. Modern Architecture.
Architecture in Europe and the United States 1750 to the present. The prerequisite is waived for students in Engineering.
Not offered 1985-86.

32. Nineteenth Century Art.
Developments in European painting and sculpture from the late 18th century through the Post-Impressionist generation of Cezanne, van Gogh, and Gauguin. Relevant social, political, economic, and cultural contexts are considered.
Fall semester. Hungerford.

35. Twentieth Century Art.
Painting and sculpture from the Post-Impressionists to the present, considered in the context of relevant social, political, economic, and cultural factors. The course focuses on art in Western Europe through the outbreak of World War II and then turns to developments in the United States beginning c. 1940.
Spring semester. Hungerford.

37. American Art.
Painting and sculpture in the United States from the Colonial Period to the present, with special attention to the relationship between developments in American art and those in Western European art.
Not offered 1985-86. Hungerford.

45. Arts of China
This course is an introduction to the religious and secular arts of China from the neolithic period through the 1980s with special emphasis on art in relation to a broad historical context. While the course will focus on painting, sculpture, and the usable arts, architecture, gardens, and city planning will also be discussed.
Fall semester. Brizendine.

46. Buddhist and Hindu Art.
The course will deal first with the rise of Buddhist art in Indian Asia and its later manifestations in China, Korea, and Japan. It will then turn to Hindu art of India and Southeast Asia. Throughout the course, art will be treated with special reference to religious, cultural and political contexts.
Spring semester. Brizendine.

47. Arts of Japan.
This course is intended to introduce the arts of Japan from ca. 6000 BCE through the present era. Topics will include the arts of Shinto and Buddhism, architecture, ceramics, painting, sculpture, and printmaking, as well as the traditional crafts and decorative arts. Strong emphasis will be placed on viewing art in relation to its larger historical context.
Not offered 1985-86. Brizendine.

48. Islamic Art.
An introduction to the art and architecture of the Islamic world. Emphasis will be on the development of a characteristic Islamic form of expression and its major regional and dynastic manifestations.
Not offered 1985-86. Cothren.

49. Colloquium on Islamic Painting.
After a brief introduction to the nature of Islamic art, this course surveys the historical evolution of Islamic painting from A.D. 691 to A.D. 1548. Emphasis is on the development of a narrative tradition for the illustration of Persian poetic and historical texts from the 14th to the 16th centuries, culminating in a detailed study of the lavish *Shahnama* of Shah Tahmasp, a project which occupied the most important painters of the period (c. 1522-35).
Not offered 1985-86. Cothren.

52. Modernism in American Art and Literature, 1870-1930.
(Also listed as English 85.) An interdisciplinary study of the origins, ideology, and development of modernism and anti-modernism in American culture between 1870 and 1930, using approaches from the fields of art history, American studies, and literary criticism. Artists include Eakins, Homer, Cassatt, the Ashcan school, the "291" group, Hopper, and Wood; writers include James, Wilkins Freeman, Crane, Fitzgerald, William Carlos Williams, and Nathanael West.
Prerequisites: one introductory course in English and one in Art History.
Not offered 1985-86. Hungerford and Schmidt.

55. Philadelphia: City and Architecture.
Architecture and urban forms, focusing on Philadelphia, in relation to the Europe of Neoclassicism, Georgian and Victorian London, Paris of the Second Empire, the Chicago School, the International Style, and Post-Modernism; topics include orthogonal planning, Penn's idealism, the row house phenomenon, the Centennial Exhibition, urban renewal and historic preservation.
Fall semester. Kitao.

56. Rome's Legacy.

History of architecture and urban planning focusing on the classical tradition in the cities and buildings in the major cities of Europe. The topics for discussion include the Classical Order; the castrum and the axial plan; the agora, the forum, and the piazza; Italian hill towns; scientific methods; the aesthetics of regularity; the ideal church and the ideal city; the palazzo and the villa; fortifications; streets and vistas; Baroque Rome; the rhetoric of the facade; and town houses and town planning.
Not offered 1985-86. Kitao.

74. History of Photography.

Origins and development of photography as a form of artistic expression and cultural communication, with emphasis on the 19th and early 20th centuries.
Not offered 1985-86. Hungerford.

75. Cinema as Iconic Discourse.

Cinema as visual and narrative art; close analysis of a few selected works (*Blue Angel, Thirty-nine Steps, Rules of the Game, Citizen Kane*) in the first half, followed by a historical survey and study of principal critical and semiotic theories. Emphasis on Bergman. Screening, lectures, discussions, papers, and filming exercises. Class limited to twenty, primarily advanced students.
Fall semester. Kitao.

85. Architectural Theory: Design, Thought, and Culture.

Topics discussed include functionalism, classicism, theory of structure and decoration; buildings as objects and environmental constructs; architecture in relation to urban planning and systems design; architecture and behavioral sciences; architecture as metalanguage; architectural semiotics; architecture in relation to history and culture. Readings cover Sullivan, Viollet-le-Duc, Ruskin, Alberti, and Vitruvius as well as more recent theories by Lynch, Alexander, Norberg-Schulz, Venturi, Eco, and Tafuri.
Instructor's consent.
Not offered 1985-86. Kitao.

91. Special Topic: Asian Landscape.

The course will examine the concept of landscape and the existence of landscape as a genre in the arts of China and Japan from a variety of points of view, including conceptual, geographical, geological, and formal. We will consider a variety of media, including painting, architecture, sculpture, literature, and possibly film.
Not offered 1985-86. Brizendine.

92. The De-Definition of Art: Issues in Art Since 1945.

After surveying major movements in art from the end of the Second World War until the mid-Seventies and examining the critical and theoretical literature which has emerged with the new art, the course will focus on the art of the late seventies and eighties. Emphasis will be placed on the role of the artist and the gallery in the contemporary art scene. Students in the course will have the opportunity to make a number of field trips to galleries in Philadelphia, Washington, D.C., and New York, and will be involved in the organization and installation of an exhibition in the Wilcox Gallery as well as in writing an extensive catalogue to accompany the show thus gaining experience in the problems of gallery management, exhibition planning and design, and handling works of art.
Not offered 1985-86. Brizendine.

93. Special Topic: The City as Artifact.

Analytical study of visual and physical aspects of cities in history from the dawn of civilization to the modern megalopolis.
Offered occasionally. Kitao.

95. Special Topic: Visual Semiotics.

Theory of signs as applied to artifacts and visual phenomena,including clothing, gestures, art and architecture, everyday objects, and advertising.
Offered occasionally. Kitao.

96. Directed Reading.

Staff.

97. Theory and Methodology.

This one-credit seminar, which is required for all course majors in art history and is normally taken in the senior year, focuses on the process of art historical inquiry. Non-majors are admitted only with the permission of the instructor.
Spring semester. Kitao.

99. Senior Thesis.

Contingent on departmental approval, a two-credit thesis in the fall semester of the senior year may be substituted for Art History 97. For Course majors in Art History only.
Fall semester. Staff.

SEMINARS

Seminars are open to all majors with the consent of the instructor; for students preparing for External Examination an appropriate course with an attachment may be substituted for a seminar in the event that seminar is not offered during the two years in which the student is eligible to take seminars.

114. Late Antique and Early Christian Art.
Not offered 1985-86. Cothren.

117. Gothic Art.
Spring semester 1987. Cothren.

125. Italian Renaissance Art.
Not offered 1985-86. Kitao.

126. Michelangelo.
Fall semester. Kitao.

128. Baroque Art.
Not offered 1985-86. Kitao.

132. Nineteenth Century Art.
Fall and spring semesters 1986. Hungerford.

135. Twentieth Century Art.
Fall semester 1986. Hungerford.

146. Chinese Painting.
Not offered 1985-86. Brizendine.

149. Islamic Painting.
Not offered 1985-86. Cothren.

191. Special Topics.
Staff.

195. Thesis.
Staff.

197. Theory and Methodology.
Spring semester 1987. Cothren.

Studio Arts

Studio Arts courses meet six hours weekly in two three-hour sessions; all courses are for full course credit unless otherwise noted. Studio Arts courses are subject to the College's limit on Creative Arts courses (see p. 52). Studio Art I is the usual prerequisite for studio arts courses; it may be waived by presenting a portfolio.

1. Introduction to Studio Arts.
Explorations in the visual description and construction of objects and ideas; problems in drawing, color, and three-dimensional form. Attention will be given both to the theoretical aspects of the work and to the development of studio techniques.
Each semester. Batchelor and Meunier.

3. Drawing.
Work in various media directed toward a clearer perception of space, light and form. A course for all levels of ability. Weekly outside drawing problems and a final project.
Each semester. Batchelor.

4. Sculpture.
This course will cover a wide range of sculptural concepts and techniques, from traditional to contemporary. These techniques will include: clay modeling, casting, multi-media assemblage, and wood construction.
Each semester. Meunier.

5. Ceramics I.
Ceramics for beginners. Introduction to hand-building and wheel techniques, and artistic use of these techniques.
Fall semester. Nagata.

6. Photography.
Introduction to the technical processes and visual and theoretical concepts of photography, both as a unique medium and as it relates to other forms of non-photographic composition.
Each semester. Meunier.

7. Ceramics II.
Artistic expression in clay forming, glazing and firing (raku, low-fire, stoneware and some porcelain).
Prerequisite: StuA 5 or equivalent.
Not offered 1985-86. Nagata.

8. Painting.
Investigation in oil paint of pictorial structure and of the complex nature of color—how it can define surface, space, light, temperature and mood.
Each semester. Batchelor.

9. Printmaking.
Techniques of intaglio, serigraph, woodcut, and the aesthetic possibilities of these techniques singly and in combination.
Not offered 1985-86. Exon.

10. Life Drawing.
Work in various media directed toward a clearer perception of the human form in nature and in art. Although the course centers on drawing from the model, many other natural forms are utilized in order fully to establish a student's appreciation of the visual world.
Not offered 1985-86. Exon.

13. Advanced Drawing.
Each semester. Batchelor.

14. Advanced Sculpture.
Each semester. Meunier.

15. Advanced Ceramics.
Tutorial in ceramics; special emphasis on personal development in explorative glazing; decorative techniques with slips, colors, textures; and understanding of firing processes. Admission by consent of the instructor.
Fall semester. Nagata.

16. Advanced Photography.
Each semester. Meunier.

18. Advanced Painting.
Each semester. Batchelor.

19. Advanced Printmaking.
Not offered 1985-86. Exon.

20. Special Studies.
Staff.

Asian Studies

Coordinator: **ALFRED H. BLOOM**

The Asian Studies Program provides an opportunity for students to become familiar with the traditions and cultures of East, South, and Southeast Asia. By fulfilling the requirements indicated below students may graduate with a Concentration in Asian Studies in addition to a regular major. A concentration may focus on East, South, or Southeast Asia. Alternatively, it may apply the approaches of one or two disciplines to more than one of these areas. The concentration is open to majors in all departments.

A student intending to concentrate in Asian Studies should submit a program proposal for approval by the Asian Studies faculty by the end of the Sophomore year. The proposal should be the result of discussion with a member of the Asian Studies faculty drawn, whenever possible, from the student's major department. It will explain what the student intends to undertake and how the Asian Studies Concentration will relate to his or her departmental major. Insofar as possible the courses or seminars required for the major and those for the Concentration should be chosen in a way that will comprise a well integrated and focussed program.

Each concentration must include at least five Asian Studies credits. At least three of them must be outside the major department and must be chosen from at least two other departments. In order to provide students with a common experience, a shared basis for identification and discussion, and a basic preparation for continuing study in the Asian area, each candidate in addition will normally be required to include in his or her program two of the following courses: History 9 (Chinese Civilization), History 72 (Japanese Civilization), Religion 2 (Patterns of Asian Religions), Religion 10 (The Hindu Tradition), Religion 11 (The Buddhist Tradition). Finally, in the senior year each student must either write a major research paper on a topic approved by the Asian Studies Committee followed by an oral examination administered by the Committee, or take a comprehensive examination administered by the Committee on the program he or she has set out. A thesis or major paper written for another department may, with the approval of the Committee, and with an oral examination administered by the Committee, be substituted for this requirement.

Courses and seminars presently offered that count toward fulfillment of the Asian Studies Concentration:

Department of Art

45. Arts of China
46. Buddhist and Hindu Art
47. Arts of Japan
91. Asian Landacape
146. Chinese Painting

Department of History

9. Chinese Civilization
72. Japanese Civilization
74. Modern China
75. Modern Japan
77. China: the Politics of History
144. Modern China

Department of Modern Languages

1B-2B Introduction to Mandarin Chinese
3B, 4B Second-year Mandarin Chinese
11. Third-year Chinese
12. Chinese Literature in Translation
15. The Chinese Language
93. Directed Reading

One credit of first- or second-year Chinese may be counted toward the concentration. All work at the third-year level or above may be counted.

Department of Music

8. Music of the Orient

Department of Political Science

19. Comparative Communist Politics
20. Politics of China
40. The Vietnam War
107. Comparative Communist Politics

Department of Religion

2. Patterns of Asian Religions
10. The Hindu Tradition
11. The Buddhist Tradition
31. Confucian Traditions in China, Korea, Japan
32. Religion in East Asia

39. Chinese Religious Texts
103. Asian Religious Thought
104. Religion in Southeast Asia

Asian Studies

93. Directed Reading
96. Concentration Paper

Other courses and seminars which include Asian materials (see departmental listings for year offered):

Department of Economics

11. Economic Development
31. Comparative Economic Systems
106. Comparative Economic Systems
109. Economic Development

Department of Religion

13. Comparative Religious Mysticism
29. Religious Belief and Moral Action
101. Religious Perspectives East and West

Department of Sociology and Anthropology

30. Religion as a Cultural Institution
107. Religion as a Cultural Institution

In planning their programs, students may wish to consult one of the following Asian Studies faculty members: Alfred H. Bloom (Linguistics), Curtis H. Brizendine (Art), T. Kaori Kitao (Art), Gerald Levinson (Music), Lillian M. Li (History), Kenneth C. Luk (Modern Languages), Steven I. Piker (Sociology-Anthropology), Donald K. Swearer (Religion), or Vivian-Lee Nyitray (Religion).

Students concentrating in Asian Studies should be aware of the opportunities which exist outside of Swarthmore for Asian language and Asian area studies: cross-registration at Bryn Mawr, Haverford, and the University of Pennsylvania during the regular academic year; study at institutes such as the Middlebury College Summer Language School during the summer; and overseas programs in India, Sri Lanka, Japan, Hongkong, the People's Republic of China, and the Republic of China (Taiwan). Overseas programs will normally be undertaken during the junior year and presuppose work in Asian Studies. Students who are interested in participating should plan well in advance so that they can take the necessary prior work as well as fulfill their other academic obligations while at Swarthmore. Work done abroad, as well as Asian languages studied outside of Swarthmore, may (with the provisions stated for Chinese language above) be counted toward the concentration.

Astronomy

JOHN E. GAUSTAD, Professor, Chairman, and Director of Sproul Observatory[1]
WULFF D. HEINTZ, Professor and Acting Chair[4]

Astronomy deals with the nature of the universe about us and the methods employed to derive the laws underlying the observed phenomena. The department offers introductory courses for students in all divisions (Astr. 1 to 4) and for science students (5 to 9). Various topics of astronomy and astrophysics are considered in detail in advanced courses, normally given in alternate years.

The principal telescope, the 61 cm. Sproul refractor with a focal length of 11 metres, is used for research on the distances, motions, orbits, and masses of stars by means of visual and photographic observations. It has been in constant operation since 1912. Other equipment includes a high-precision measuring machine for the photographs, installed in 1971, photoelectric and photographic photometers, and a Brashear micrometer. A 61-cm. reflector equipped with a high-resolution spectrometer, operated in conjunction with the Physics department, is available for solar and stellar spectroscopy. A 15-cm. refractor and a 20-cm. reflector are used for instruction and for student projects. The Astronomy Library possesses a large collection of research publications. Visitors' Nights at the Observatory are announced in the monthly calendar of the College.

REQUIREMENTS AND RECOMMENDATIONS

Students who intend to major in Astronomy should plan to take Mathematics 5, 6 and Physics 3, 4 in their freshman year. Physics 14, 15, and one or more of Mathematics 16, 18, 23, or 30 should be undertaken in the sophomore year. Astronomy 5, 6 can be completed in either the freshman or sophomore year.

An Astronomy major is required to complete eight credits which include Astronomy 5, 6, 21, 22, and 59.

In collaboration with the Department of Physics, the Department offers a Special Major in Astrophysics, requiring a minimum of eight courses in Physics and four courses in Astronomy. Interested students should consult the Chairman of either department.

1. Introductory Astronomy.
A one-semester course which highlights the scientific investigation of the universe by observation and theory, and includes the basic notions of physics as needed in astronomical applications. Topics include astronomical instruments and radiation; the sun and planets; properties, structure, and evolution of stars; the Galaxy and extra-galactic systems; and the origin and evolution of the universe. Three class periods each week plus evening labs.
Fall semester. Heintz.

3. Frontiers of Astronomy.
Exploration in depth of a few topics of current interest, such as evolution of stars and the black-hole problem, planetary exploration, search strategies for cosmic life, advances in astronomical instrumentation, missing mass in the universe.
Prerequisite: Astronomy 1.
Spring semester. Heintz.

4. Concepts of the Cosmos.
A history-oriented introduction, with emphasis

1 Absent on leave, fall semester, 1985.

4 Fall semester, 1985.

on the oriental and hellenistic development of astronomical and mathematical methods, the motions of the celestial sphere, and the evolution of observation and astrophysics in the 200 years from Halley to Einstein. Includes nighttime observing sessions.
Not offered 1985-86.

5, 6. General Astronomy I, II.

Intended for science students, these courses introduce the methods and results of astronomy and astrophysics, making use of basic physical and mathematical principles. They are prerequisites for courses numbered 21 and above.

Fall: Celestial coordinates. Astronomical instruments. Laws of physics relevant to astronomy. Observed properties of stars. Stellar structure and evolution. Star clusters. Celestial mechanics. Binary stars.

Spring: Interstellar matter. The Milky Way Galaxy. Galaxies and quasars. Cosmology. The Sun. The Solar system.

Prerequisite: Mathematics 5 or equivalent.
Corequisites: Physics 3 and 4.
Fall semester: Heintz. *Spring semester:* Gaustad.

9. Introduction to Meteorology.

The elements of weather, its recording and prediction. Structure and dynamics of the atmosphere. Includes regular weather observations and comparison with maps.
Prerequisites: Mathematics 5, 6, or equivalent.
Not offered 1985-86.

21, 22. Theoretical Astrophysics I, II.

Techniques applied to the physical interpretation of astronomical phenomena. Topics include electromagnetic processes in space, quantum and relativistic astrophysics, radiative transfer in stellar atmospheres, interpretation of stellar spectra, and stellar structure and evolution. Problems and projects will be assigned.
Prerequisites: Astronomy 5, 6; Physics 14, 15, or consent of instructor.
Not offered 1985-86.

23. Methods of Observational Astronomy.

Theory and practice in the techniques of modern optical astronomy. Instrumentation: Telescopes, spectrographs, photometers, electronic detectors, measuring equipment. Spectral classification; data analysis. The photographic process. Students will undertake projects using the Swarthmore telescopes.
Prerequisites: Astronomy 5, 6.
Not offered 1985-86.

55. Planetary Science.

Methods and results of the exploration of the solar system. May be taken as a writing course (containing literature surveys and papers).
Prerequisite: Astronomy 6.
Not offered 1985-86.

56. Cosmology.

General relativity and the theoretical framework of cosmology. World models. Optical and radio results on galaxies and quasars.
Prerequisites: Astronomy 5, 6; Mathematics 6.
Spring semester. Heintz.

59. Positional Astronomy.

Coordinate systems and transformations; fundamental and apparent positions; proper-motion and binary-star analysis.
Prerequisite: Astronomy 6.
Fall semester. Heintz.

61. Current Problems in Astronomy and Astrophysics.

The course will involve reading and discussion of selected research papers from the astronomical literature. Instruction will be given in techniques of journal reading, use of abstract services, and other aids for the efficient maintenance of awareness in a technical field.
Not offered 1985-86. Gaustad.

66. Peculiar Stars.

A study of the observed properties and physical models for variable stars, novae, supernovae, white dwarfs, neutron stars, black holes, and stars with peculiar spectra.
Prerequisites: Astronomy 5, 6; Physics 15.
Not offered 1985-86.

93. Directed Reading.

Staff.

94. Research Project.

Staff.

Biology

JOHN B. JENKINS, Professor
ROBERT E. SAVAGE, Professor
NANCY V. HAMLETT, Associate Professor[3]
MARK JACOBS, Associate Professor
BRUCE MOLHOLT, Visiting Associate Professor
JACOB WEINER, Associate Professor[3]
TIMOTHY C. WILLIAMS, Associate Professor and Chair
JONATHAN COPELAND, Assistant Professor
GREGORY L. FLORANT, Assistant Professor
SCOTT F. GILBERT, Assistant Professor
RACHEL A. MERZ, Assistant Professor
BARBARA Y. STEWART, Assistant Professor and Associate Chair
ALAN J. TESSIER, Lecturer
TEDD R. GOUNDIE, Assistant
GLORIA U. ROSEN, Assistant

The student may be introduced to biology by enrolling in Biology 1 and Biology 2. Either course may be taken first. A diversity of intermediate and advanced courses, some offered in alternate years, affords the student the opportunity of building a broad biological background while concentrating, if desired, in some specialized areas such as cellular and molecular biology, or organismal and population biology. Intermediate courses are numbered 10-50; courses numbered beyond 50 are advanced. A special major in biochemistry is offered in cooperation with the Department of Chemistry (cf. *Chemistry*). A special major in psychobiology is offered in cooperation with the Department of Psychology (cf. *Psychology*).

REQUIREMENTS AND RECOMMENDATIONS

Students electing a Course major in Biology should include the following supporting subjects in addition to the minimum of eight courses composing the major: introductory chemistry, at least one semester of organic chemistry, and two semesters of college mathematics. These courses should be completed before the senior year. Introductory physics is strongly recommended, and is prerequisite to some departmental offerings. Further, it should be noted that medical schools and graduate schools in biology require introductory physics for admission.

Students majoring in Biology must take at least one course in each of the following three groups: I, cell and molecular biology (i.e. 20, 21, 32, 34, 38, 51, 53, 56, 58, 74); II, organismal biology (i.e. 12, 28, 31, 36, 37, 52, 57, 73, 78, 178); III, populational biology (i.e. 10, 17, 25, 40, 50, 68, 69, 70, 160).

Specific recommendations and options for biology are published each year in *The Biology Handbook*, which is presented to students who have been accepted as majors in the department.

EXTERNAL EXAMINATION PROGRAM

Qualified students may prepare for External Examinations in areas such as animal behavior, cell or developmental biology, ecology, evolution, genetics, microbiology, plant or animal

3 Absent on leave, 1985-86.

physiology via seminars or combinations of courses. Admission to the Honors Program is based on academic record and completion of prerequisites for the courses or seminars used in preparation for external examination. Departmental requirements in chemistry and mathematics must also be fulfilled. Students majoring in Biology include Thesis, Biology 180, as part of their external examination program.

1. Cellular and Molecular Biology.

An introductory study of phenomena fundamental to living systems illustrated by examples drawn from the fields of microbiology, cell biology, genetics, and developmental biology. Emphasis is upon the means by which biologists have attempted to elucidate these phenomena rather than upon a survey of them.
One laboratory period per week.
Enrollment limited to 150.
Fall semester. Staff.

2. Organismal and Population Biology.

An introduction to the study of whole organisms, chiefly the higher plants and animals. Stress is placed on adaptive aspects of the morphology and physiology of organisms, their development, behavior, ecology, and evolution.
One laboratory period per week.
Enrollment limited to 150.
Spring semester. Staff.

10. Human Evolution.

Cross-listed with Sociology/Anthropology 10. (cf. *Sociology/Anthropology*).

12. The Vertebrates.

A consideration of the anatomy of vertebrate classes from an evolutionary viewpoint. Structure and function of particular vertebrate organs are emphasized. Laboratory exercises include dissection, physiological demonstrations, films, an introduction to basic histology, and when possible, radiographic presentations.
One laboratory period per week.
Prerequisites: Biology 1, 2.
Enrollment limited to 24.
Spring semester. Florant.

17. Systematic Botany.

Principles and methods of plant systematics approached through the classification and identification of the major families of vascular plants. Emphasis is upon the flora of the northeastern United States. The course is open to biology majors and interested non-majors.
Two lecture-laboratory periods or field trips per week.
Prerequisites: Biology 2 or consent of instructor.
Enrollment limited to 16.
Not offered 1985-86.

18. Biology and Ecology of Lower Plants.

Biology, systematics and ecology of algae, mosses, and liverworts. Lectures will focus on morphology, phylogeny, and ecology of lower plants from an evolutionary perspective. Laboratory will focus on methods of collection, identification, and culture, with an emphasis on freshwater algae.
One laboratory period per week.
Prerequisites: Biology 1 and 2.
Enrollment limited to 18.
Spring semester. Tessier.

20. Genetics.

An examination of the transmission, structure, and function of the genetic material. The course content includes the establishment of Mendelism; the chromosome theory of inheritance; the expansion of Mendelism; the identification, structure, and replication of the genetic material; gene function; bacterial and viral genetics; and the regulation of gene activity.
One laboratory period per week.
Prerequisite: Biology 1.
Enrollment limited to 32.
Spring semester. Jenkins.

21. Cell Biology.

A study of the ultrastructure and function of cell components, cell division, biosynthesis of macromolecules, and intermediary metabolism. Laboratory exercises are designed to illustrate the variety of approaches to findings in cell biology.
One laboratory period per week.
Prerequisites: Biology 1, Organic Chemistry.
Enrollment limited to 32.
Spring semester. Savage.

25. Animal Behavior.

Ethological studies of animal behavior under laboratory and natural conditions. Subjects of study include primarily vertebrates and the social insects. Class work involves both lectures and seminar format. Laboratories consist of

field trips and small group projects in the local area.
One laboratory period per week.
Prerequisites: Biology 2. Math 2 recommended.
Enrollment limited to 24.
Alternate years, fall semester. Williams.

28. Crop Plants.

An introduction to the plants used as food by man: their origins and evolution, growth and development, nutritional value, production methodology and breeding for yield improvement and pest resistance. Labs will examine the preparation and processing of crops for use as food by man and will include several field trips to production farms and experimental farms in the area.
One laboratory period per week.
Prerequisite: Biology 2, or permission of the instructor.
Spring semester. Jacobs.

29. Neurophysiology.

Properties of nerve, muscle, synapse, neuronal networks, and intact nervous systems in invertebrates and vertebrates. Sensory processing, developmental specificity, and learning will also be discussed. The laboratory will provide students experience with a number of preparations demonstrating functional aspects of the activity of nerve cells.
One laboratory period per week.
Prerequisites: Biology 1 and 2.
Enrollment limited to 30.
Fall semester. Copeland.

30. Environmental Genotoxicity.

An examination of toxic substances in our environment which induce cancer and birth defects. Emphasis is on the mechanisms of action of chemical and radiation carcinogens and mutagens as deduced from human epidemiology, animal experimentation, and molecular biology. Solutions to problems posed by human exposure to environmental genotoxins will be stressed.
Prerequisites: Biology 1, Chemistry 22; Biology 20 recommended.
Enrollment limited to 12.
Spring semester. Molholt.

31. Endocrinology.

This sophomore/junior level course will cover the endocrine system in moderate detail. Each of the major endocrine glands will be discussed with regard to histology, structure, and function. Students will be asked to write papers on specific endocrine topics or participate in ongoing endocrine research in the department (Laboratory Projects).
Prerequisites: Biology 1 and 2; 12, 21, or 32 recommended.
Enrollment limited to 24.
Alternate years, fall semester. Florant.

32. Membrane Molecular Biology.

An examination of the structure and function of biological membranes. Topics include structural organization, lipid metabolism, energy transduction, transport systems, and mechanisms for the recognition and control of cellular activity. Students are required to present a major report on a selected area of contemporary research in any area of molecular biology.
Prerequisites: Biology 1, Organic Chemistry.
Enrollment limited to 18.
Alternate years, spring semester. Stewart.

34. Immunology.

A survey of the humoral and cellular mechanisms by which vertebrates recognize and destroy material foreign to their bodies. Special attention will be given to the cellular interactions leading to immunocompetency and to the strategies whereby certain microorganisms, tumors, and fetal cells avoid immune detection.
One laboratory period per week.
Prerequisites: Biology 1 and 2. 20 or 21 recommended.
Enrollment limited to 32.
Not offered 1985-86.

36. Invertebrate Zoology.

The evolution and adaptive biology of invertebrate animals. Consideration is given to adaptive morphology, phylogeny, ecology, and physiology of invertebrates.
One laboratory period per week. Field trips.
Prerequisites: Biology 1 and 2.
Enrollment limited to 24.
Alternate years, fall semester. Merz.

37. Plant Physiology.

A study of the principal physiological processes of higher plants, including photosynthesis, gas exchange, water and nutrient transport, mineral metabolism, plant hormone action, and environmental responses.
One laboratory period per week.

Prerequisites: Biology 1, 2, and Organic Chemistry.
Enrollment limited to 20.
Fall semester. Jacobs.

38. Microbiology.

Biology of microorganisms with an emphasis on aspects unique to prokaryotes. Topics include microbial cell structure, metabolism, physiology, genetics, and ecology. Laboratory exercises include techniques for detecting, isolating, cultivating, quantifying, and identifying bacteria.
One laboratory period per week.
Prerequisites: Biology 1, Chemistry 22.
Enrollment limited to 36.
Fall semester. Molholt.

39. Ecology.

Introduction to factors controlling the distribution and abundance of species. Topics include interactions among organisms and their environments, evolution, population dynamics, life history theory, community structure and function, nutrient cycling, and pollution ecology. Emphasis is on providing a basic introduction to the many branches of modern ecology. Several field trips will explore both aquatic and terrestrial ecosystems.
One laboratory period or field trip per week.
One weekend trip to Pocono Mountains.
Prerequisites: Biology 1 and 2.
Enrollment limited to 20.
Fall semester. Tessier.

40. Evolution.

An introduction to the history and principles of evolutionary biology. The course content includes a brief history of evolutionary theory; population: structure and concept; the principle of the equilibrium population; microevolutionary changes; the process of speciation; and macroevolutionary changes that include selected evolutionary pathways.
Laboratory/discussion periods.
Prerequisites: Biology 1 and 2, or consent of instructor.
Enrollment limited to 32.
Not offered 1985-86.

41. Issues in Biology and Religion.

A historical survey and contemporary analysis of the interaction between biological and physical theories and religious thought from Biblical times to the present. Among topics discussed will be the religion, biology, and physics of Plato and Aristotle; the explanatory theories of Spinoza and Leibniz; Newtonian physics and natural theology; Darwinian evolution, God and ethics; religion in the light of 20th century biology and physics.
The weekly laboratory meetings will be devoted to special topics and lecturers.
Enrollment limited to 20.
Cross-listed with Religion 41. Gilbert and Urban (Religion).
Prerequisites: Biology 1 and 2 and a religion course.

50. Marine Biology.

Ecology of oceans and estuaries, including discussions of physiological and structural adaptations of marine animals, plants, and micro-organisms.
One laboratory period per week; several all-day field trips.
Prerequisites: Biology 1 and 2.
Enrollment limited to 24.
Not offered 1985-86.

51. Cells in Culture.

The biology of plant and animal cells as revealed through studies on eukaryotic cells *in culturo*. Discussions focus on cell surfaces, growth, locomotion, transformation, and on somatic cell hybridization studies. In the laboratory, techniques of animal and plant cell culture and of somatic cell fusion are introduced. Students then undertake independent investigative projects.
Continuing laboratory work.
Prerequisite: Biology 21 or consent of instructor.
Enrollment limited to 12.
Fall semester. Savage.

52. Developmental Biology.

An integration of molecular and organismal aspects of animal development. Topics include fertilization and embryonic cleavage, the formation of representative organs, cell migration, developmental genetics, pattern formation, and the roles of the cell surface in development. Laboratory exercises investigate the developmental anatomy of selected organisms in normal and manipulated conditions, and molecular aspects of differential gene expression.
One laboratory period per week.
Prerequisites: Biology 20 or 21.
Enrollment limited to 18.
Fall semester. Gilbert.

53. Virology.

A study of viruses with emphasis on their molecular biology. Topics include techniques for studying and cultivating viruses, virus structure and replication, the interactions of viruses and their hosts, and properties of selected groups of viruses. Laboratory exercises use bacteriophage to demonstrate techniques for studying viruses.
One laboratory period per week.
Prerequisite: Biology 21 or 38. Biology 20 recommended.
Enrollment limited to 18.
Spring semester. Molholt.

56. Human Genetics.

An examination of human inheritance patterns using techniques of genetic analysis that are appropriate to humans. Research into the structure, function, organization, and regulation of the human genome will be discussed, along with applications of current research.
Laboratory project.
Prerequisites: Biology 20 or permission of the instructor.
Enrollment limited to 12.
Not offered 1985-86.

57. Animal Physiology.

A comparison of major physiological systems among vertebrates. The endocrine, cardiovascular, renal, respiratory, and central nervous systems are studied in detail. Emphasis is also placed on physiological control processes involved in the various adaptations to unusual environments. Laboratory exercises include investigation of physiological responses to different stimuli in various species, including humans.
One laboratory period per week.
Prerequisites: Biology 12; Physics 2 or 4 recommended.
Enrollment limited to 12.
Alternate years, fall semester. Florant.

58. Biological Chemistry.

Cross-listed with Chemistry 58. (cf. *Chemistry*).

62. Biomechanics.

This course is designed to introduce biologists to engineering theory and techniques for application to the study of the design of organisms. The basic principles of solid and fluid mechanics will be explored as they apply to the morphology, ecology, and evolution of plants and animals. Lectures, discussions of recent papers, and laboratory and field experiments will be held.
Prerequisites: Biology 1, 2 and some other biology course, or permission of the instructor.
Enrollment limited to 12.
Spring semester. Merz.

64. Developmental Neurobiology.

Development and regeneration of neurons, central and peripheral connections, and neuronal circuits, using invertebrate and vertebrate nervous systems, from tissue culture to behavior. The laboratory will introduce students to a variety of intermediate and advanced techniques in neurobiology.
One laboratory period per week.
Prerequisites: Biology 29 and 21, or permission of the instructor.
Enrollment limited to 30.
Spring semester. Copeland.

68. Microbial Ecology.

A study of the interrelationships of microorganisms and their environment with emphasis on the biological, biochemical, and physiological elements affecting microbial populations and communities.
Seminar format and investigative laboratory projects.
Prerequisite: Biology 38.
Enrollment limited to 12.
Not offered 1985-86.

70. Plant Ecology.

An advanced course which considers plant individuals, populations and communities in their relationships with their physical and biological environments. Areas developed include climatology, soil science, plant population biology, competition, herbivory, plant communities and ecosystem analysis. Laboratory and field work emphasize hypothesis formation and the collection, analysis, and interpretation of data.
One laboratory period or field trip per week. All Saturdays during the first half of the semester must be reserved for field work.
Prerequisites: Concurrent or previous enrollment in Biology 39 and consent of instructor.
Enrollment limited to 10.
Not offered 1985-86.

73. Animal Orientation and Migration.

An investigation of the long distance move-

ments of animals, the sensory systems that guide those movements and the physiological mechanisms that stimulate and support migration. Laboratory consists of original research projects. The course is conducted in seminar format. Partial overlap with Biology 78.
Prerequisites: Biology 12 or 25 or permission of the instructor. Physics and Math 2 are recommended.
Enrollment limited to 12.
Not offered 1985-86.

74. Developmental Genetics.

An investigation of the various mechanisms governing eukaryotic gene expression concentrating on gene activity in early development and on specific cases of differential gene expression.
Seminar format.
Prerequisite: Biology 21, 52, or permission of instructor.
Enrollment limited to 10.
Alternate years, spring semester. Gilbert.

78. Neurobiology and Behavior.

A consideration of the mechanisms underlying animal behavior. Areas of primary interest are neurobiology, sensory physiology, orientation, and biorhythms. Material is presented in both lecture and seminar format.
Partial overlap with Biology 73.
One laboratory period per week.
Prerequisites: Biology 12 or 25 or permission of the instructor; Physics 2 or 4. Math 2 recommended.
Enrollment limited to 12.
Not offered 1985-86.

93. Directed Reading.

With the permission of a staff member who is willing to supervise it, a qualified student may undertake a program of directed reading in an area of biology not included in the curriculum, or as an extension of one of his/her courses.
Fall or spring semester. Staff.

94. Research Project.

With the permission of the Department, qualified students may elect to pursue a research program.
Fall or spring semester. Stewart, Staff.

95. Senior Literature Paper.

A senior paper is required of all senior Course majors in Biology in satisfaction of the requirement of a comprehensive examination for graduation. However, students are not required to enroll in 95 while writing the paper. Does not count as a course for the major.

96. Senior Research Paper.

With the permission of the Department, qualified students may elect to present a research thesis in satisfaction of the requirement of a comprehensive examination for graduation. The research may be done under the direction of a scientist either at this college or elsewhere, but the student must be the principal investigator of the research. Does not count as a course for the major. Students are not required to enroll in 96 while writing the paper.

SEMINARS

157. Animal Physiology Seminar.

See description of Biology 57. Students are expected to attend lectures given in Biology 57 and to participate in the laboratory. The seminar laboratory consists of research projects in animal physiology and seminar work.
One laboratory period per week.
Prerequisites: Biology 12; Physics 2 or 4 recommended.
Enrollment limited to 12.
Alternate years, fall semester. Florant.

160. Behavioral Ecology.

The study of the evolution of behavior as an adaptation to an environment. Topics include, but are not limited to, environmental factors affecting social structure, optimal foraging strategies, mating systems, coevolution and sex roles. Topics covered will vary depending on student interest but usually include a consideration of primate social systems and their relevance to human evolution.
Prerequisites: Biology 25 or 40 or 39. Students

with preparation outside biology should seek permission of the instructor.
Enrollment limited to 12.
Alternate years, fall semester. Williams.

178. Neurobiology and Behavior Seminar.

A discussion of the mechanisms underlying behavior. In addition to traditional discussions of sensory physiology and orientation, a large segment of the seminar is devoted to discussion of those preparations in which behavior can be understood by the actions of a small number of neurons. Relatively little time is spent on vertebrate CNS function or brain function as these topics are treated extensively in other biology or psychology courses at the College.
Prerequisites: Biology 12 or 25, Physics 2 or 4, or permission of the instructor; Math 2 recommended.
Enrollment limited to 12.
Alternate years, spring semester. Williams.

180. Thesis.

A research project is required of Biology majors who participate in the external examination program. Students minoring in Biology may elect to present a research thesis as part of their external examination program.

Black Studies

Coordinator: **STEVEN I. PIKER**

The purpose of the Black Studies Program is (1) to introduce students to the history, culture, society, and political and economic conditions of Black people in Africa, the Americas, and elsewhere in the world; and (2) to explore new approaches—in perspectives, analyses and interdisciplinary techniques—appropriate to the study of the Black experience.

Students in any department may add a Concentration in Black Studies to their departmental major by fulfilling the requirements stated below. Applications for admission to the Concentration should be made in the spring semester of the sophomore year to the Coordinator of the Program. All programs must be approved by the Committee on Black Studies.

All Concentrators in Black Studies are required to take History 7, as early as feasible, and Black Studies 91, ordinarily in the last semester of the senior year. They must take a minimum of five courses in Black Studies. These must include at least three courses (which may include Black Studies 91) outside the departmental major, from at least two departments other than the major.

Black Studies 91, Special Topics in Black Studies, will take the form of a one-credit tutorial (if there are three or fewer students in any one year) or a seminar (if there are four or more students), with all senior Concentrators participating. The topics selected for reading, class discussions, and the writing of seminar papers will be drawn from a list of representative works in Black Studies from a variety of disciplines and perspectives and will depend on the interests and backgrounds of the participants. The tutorial or seminar will normally be taken in the spring semester of the senior year, and will culminate in a comprehensive examination administered by the Black Studies Committee.

Courses of the Black Studies Concentration are listed below. Courses of independent study, special attachments on subjects relevant to Black Studies, and courses offered by visiting faculty (those courses not regularly listed in the College Bulletin) may, at the discretion of the Black Studies Committee, be included in the Program. Students who wish to pursue these possibilities should consult with the appropriate department and with the Black Studies Committee.

Economics 26. Social Economics.

English Literature 11. Figures in the Veil.

English Literature 14. Introduction to Contemporary African Literature.

English Literature 59. The Black American Writer.

English Literature 60. The Contemporary Black Writer of the United States.

English Literature 76. The Black African Writer.

English Literature 77. Freedom and the African Writer.

English Literature 121. Modern Black Fiction.

History 7. The History of the African American People.

History 8. Africa.

History 53. Black Culture and Black Consciousness.

History 56. Ex-Slave Narratives.

History 58. The World of DuBois, Rogers, and Diop.

History 63. South Africa.

History 67. The African in Latin America.

History 140. Modern Africa.

History 141. South Africa.

Political Science 21. Politics of Africa.

Political Science 44. Race, Ethnicity, and Public Policy.

Black Studies

Religion 24. Martin Luther King, Jr., and the Black Struggle for Freedom in America.

Religion 38. The Roots of the Black Freedom Movement in America, 1865-1955.

Sociology-Anthropology 27. Afro-American Culture and Society.

Sociology-Anthropology 36. Peoples and Cultures of Africa.

Black Studies 91. Special Topics in Black Studies (senior thesis).

Chemistry

EDWARD A. FEHNEL, Professor Emeritus and Lecturer[5]
JAMES H. HAMMONS, Professor[2]
ROBERT F. PASTERNACK, Professor and Chairman[1]
PETER T. THOMPSON, Professor
JUDITH G. VOET, Associate Professor and Acting Chair[4]
JEFFREY A. CHARONNAT, Assistant Professor
ANN E. SHINNAR, Assistant Professor
THOMAS A. STEPHENSON, Assistant Professor
ROBERT D. FISHER, Lecturer
URSULA M. DAVIS, Assistant
MARGARET M. LEHMAN, Assistant
NITA H. SICILIANO, Assistant

The aim of the Department of Chemistry is to provide sound training in the fundamental principles and basic techniques of the science and to provide interested students with the opportunity for advanced work in the main subdisciplines of modern chemistry.

REQUIREMENTS AND RECOMMENDATIONS

The normal route for entrance to the advanced level program is to take Chemistry 10 followed by 22, 32. Students with especially strong pre-college background in chemistry may be advised to begin with Chemistry 22. Such students will normally be asked to take a placement examination. Students seeking Advanced Placement credit may also be required to take this examination. Consult with the Department Chairman.

The minimum requirement for a major in Chemistry is nine courses in the Department. These must include Chemistry 10, 22, 32, 34, 36, 45 and three additional courses of which a minimum of two must have a laboratory. At least one of these courses should be selected from Chemistry 52, 57, or 78. The second laboratory course may be Chemistry 94 or 96. Students should note the Mathematics and Physics prerequisites for Chemistry 34, 36 and 45. Those considering a major in Chemistry are strongly urged to complete these prerequisites by the end of the Sophomore year.

Those students planning professional work in Chemistry should include in their programs a fourth semester of mathematics and at least two additional courses in chemistry. Those wishing to obtain a degree accredited by the American Chemical Society should include both Chemistry 57 and 76 in their programs. ACS accreditation is useful for those who intend to pursue a career in chemical industry. Further, proficiency in reading scientific German, Russian, or French is an asset to the practicing chemist.

Research opportunities with individual staff members are available through Chemistry 94, 96 and 180. Majors are encouraged to consult the staff about current research problems under investigation.

In collaboration, the Departments of Chemistry and Physics provide for a Special Major in Chemical Physics (see discussion of Special Major, page 47), which offers students the opportunity to gain strong background in the study of chemical processes from a microscopic, molecular point of view. Interested students should consult the Chairmen of both departments.

1 Absent on leave, fall semester, 1985.
2 Absent on leave, spring semester, 1986.
4 Fall semester, 1985.
5 Spring semester, 1986.

BIOCHEMISTRY SPECIAL MAJOR

In collaboration with the Department of Biology, the Department of Chemistry also offers a Special Major in Biochemistry, which provides the student with the opportunity to gain a strong background in chemistry with special emphasis on the application of chemistry to biochemical and molecular biological problems. The requirements include Chemistry 10, 22, 32, 34, 36, 45, 58, and 78; Biology 1, (21 or 38), (53 or 74), and one other Biology course chosen with the assistance of the biochemistry advisor. Research opportunities are available in both Biology and Chemistry Departments. Interested students should consult the Chairmen of the two departments.

EXTERNAL EXAMINATION PROGRAM

Students preparing for the External Examination program in Chemistry should complete Chemistry 10, 22, 32 and 36 (or 34), two years of college mathematics, and two semesters of physics by the end of the sophomore year. Preparation for each paper consists of a combination of one course and one seminar-course as follows: Organic Reaction Mechanisms (62+72); Quantum Chemistry (34+74); Physical Chemistry (45+75); Inorganic Chemistry (36+76); Biological Chemistry (58+78). A research thesis (180) must be included as one of the Papers. Interested students should consult with the Chairman of the Department.

10. General Chemistry.

A study of the central concepts and basic principles of chemistry; the interpretation of chemical properties and reactions on the basis of equilibrium constants, oxidation potentials, free energies, thermochemistry; atomic structure; bonding and molecular structure; rates and mechanisms of chemical reactions.
One laboratory period weekly.
Fall semester. Voet and Staff.

22. Organic Chemistry I.

An introduction to the chemistry of some of the more important classes of organic compounds; nomenclature, structure, physical and spectroscopic properties, methods of preparation and reactions of alphatic and aromatic hydrocarbons, halides and several types of monofunctional oxygen compounds, with an emphasis on ionic reaction mechanisms.
One laboratory period weekly.
Prerequisite: Chemistry 10.
Spring semester. Shinnar.

32. Organic Chemistry II.

A continuation of Chemistry 22 with emphasis on more advanced aspects of the chemistry of monofunctional and polyfunctional organic compounds, multi-step methods of synthesis, and an introduction to bioorganic chemistry.
One laboratory period weekly.
Prerequisite: Chemistry 22
Fall semester. Charonnat.

34. Quantum Chemistry.

An introduction to some basic physical chemitry concepts at the atomic and molecular level including particles and waves, elementary quantum theory, atomic and molecular structure, valence bond and molecular orbital theory, symmetry and group theory, spectroscopy, statistical mechanics, and reaction rates..
One laboratory period weekly.
Prerequisites: Chemistry 10, Mathematics 18, Physics 4 (or 2).
Spring semester. Stephenson.

36. Inorganic Chemistry.

A study of the main group elements, acid-base reactions, oxidation-reduction reactions, electrochemistry, and an introduction to transition metal chemistry. Laboratory will emphasize the preparation and analysis of inorganic compounds.
One laboratory period weekly.
Prerequisites: Chemistry 10, Mathematics 6, and concurrent enrollment in Physics 4 (or 2).
Spring semester. Pasternack.

45. Thermodynamics.

An introduction to some basic concepts of physical chemistry including states of matter, kinetic theory of gases, laws of thermodynam-

ics, chemical and phase equilibria, solutions, and solid state structure.
One laboratory period weekly.
Prerequisites: Chemistry 10, Mathematics 18, Physics 4 (or 2).
Fall semester. Stephenson.

52. Organic Structure Determination.

Classroom and laboratory study of the principles and techniques involved in the elucidation of the structures of organic compounds. Emphasis is placed on the correlation of structure and properties of organic molecules and on the theoretical principles underlying various chemical and spectroscopic methods of identification and structure determination.
One four-hour laboratory period weekly.
Prerequisite: Chemistry 22, 32.
Spring semester. Fehnel.

57. Instrumental Chemical Analysis.

A study of the principles and techniques of modern instrumental analysis in chemistry. Elementary electronics with emphasis on digital logic and computer applications of data collection and control in chemical analysis are studied.
One four-hour laboratory period weekly.
Prerequisites: Chemistry 45 and concurrent enrollment in Chemistry 34.
Spring semester. Thompson.

58. Biological Chemistry.

An introduction to the chemistry of living systems: protein conformation, principles of biochemical preparation techniques, enzyme mechanisms and kinetics, bioenergetics, intermediary metabolism, and molecular genetics.
Prerequisites: Chemistry 32 and Biology 1 (Biology 21 recommended).
Fall semester. Shinnar.

62. Polar Organic Reaction Mechanisms.

A variety of topics in physical organic chemistry including valence bond theory, stereochemistry, linear free-energy relationships, thermochemistry, kinetics and mechanisms, acid-base theory, nucleophilic aliphatic substitution, ionic addition and elimination reactions, aromatic substitution, and ionic reactions of carbonyl compounds.
Prerequisite: Chemistry 32.
Fall semester. Hammons.

SEMINAR COURSES

The following single credit courses taught in seminar style may be taken for course credit or combined with other courses to prepare for Papers in the External Examination Program.

72. Advanced Organic Chemistry.

Topics will include symmetry, molecular orbital theory, and free-radical, pericyclic, and photochemical reactions.
Prerequisite: Chemistry 32.
Fall semester. Not offered 1985-86.

74. Advanced Quantum Chemistry.

Topics to be studied will be selected from laser chemistry, molecular orbital calculations, spectroscopy, quantum theory of light, scattering theory, group theory, and time-dependent perturbation theory.
Prerequisites: Chemistry 34 and 45 and Mathematics 16.
Fall semester. Not offered 1985-86.

75. Advanced Physical Chemistry.

Topics to be studied will be selected from more advanced aspects of thermodynamics and statistical mechanics including interactions in the gaseous and liquid states, the theory of solutions, and chemical reaction dynamics.
Prerequisites: Chemistry 34 and 45.
Spring semester. Thompson.
Not offered 1986-87.

76. Advanced Inorganic Chemistry.

The study of topics to be selected from applications of symmetry and group theory; transition metal chemistry; bonding; reaction mechanisms; spectroscopy; organometallic chemistry; bioinorganic chemistry; and solid state chemistry.
Prerequisites: Chemistry 34, 36, and 45 or permission of the instructor.
Spring semester. Pasternack.
Not offered 1986-87.

78. Advanced Biological Chemistry.

Reading and laboratory projects in a few important areas of current biochemistry, such as enzyme structure and function, spectroscopic methods, nucleic acid conformation,

mechanisms of transcriptional and translational control in bacteriophage and in higher organisms, chromosomal organization in eucaryotes, immunochemistry, and membrane-associated phenomena.

One four-hour laboratory period weekly. Prerequisites: Chemistry 45 and 58 or permission of the instructor. Prior or concurrent enrollment in Biology 20 or 21 is recommended. *Spring semester.* Voet.

STUDENT RESEARCH

All students who enroll in one or more research courses during the academic year are required to attend weekly colloquium meetings and to make an oral presentation of the results of their work during the spring semester.

94. Research Project.

This course provides the opportunity for qualified students to participate in research with individual staff members. Periodic group meetings of all participants will allow interchange of ideas on research plans, progress, and results. Students who propose to take this course should consult with the staff during the preceding semester concerning problem areas under study. This course may be elected more than once.

Each semester. Staff.

96. Research Thesis.

Chemistry and biochemistry majors will be provided with an option of writing a senior research thesis in lieu of taking comprehensive examinations. Students must apply for the thesis option by the beginning of the second semester of the junior year and are strongly urged to participate in on-campus research during the summer between their junior and senior years. The student will form an advisory committee to consist of (but not be limited to) two members of the Chemistry Department, one of whom is to act as the student's research mentor. Whereas the details of the research thesis program will be determined by the committee and the student, certain minimum requirements must be met by all students selecting this option:

i) A minimum of two credits of Chem. 96 to be taken during the last three semesters of the student's residence at Swarthmore.
ii) A minimum of eight Chemistry courses other than Chem. 94 and/or Chem. 96.
iii) A thesis based upon the student's research activity to be submitted prior to the last week of classes of the final semester. Guidelines for the preparation of the thesis will be provided to the student.

Each semester. Staff.

180. Research Thesis.

An opportunity for students in the External Examination program to participate in research with individual staff members. The thesis topic must be chosen in consultation with some member of the staff and approved early in the semester preceding the one in which the work is to be done.

Each semester. Staff.

Classics

HELEN F. NORTH, Professor and Chairman
MARTIN OSTWALD, Professor
GILBERT P. ROSE, Professor
BARBARA BURRELL, Assistant Professor
GARY FORSYTHE, Assistant Professor
WILLIAM N. TURPIN, Assistant Professor[3]

The Department of Classics offers instruction in the various fields which constitute the study of Greek and Roman culture. Courses numbered from 1 to 20 are devoted to the Greek and Latin languages and literatures. Courses numbered from 21 onwards presuppose no knowledge of the Greek or Latin languages and are open (except for 42, 44, and 52) without prerequisite to all students; they deal with the history, mythology, religion, archaeology, and other aspects of the ancient world and include the study of classical literature in translation.

Swarthmore College contributes to the American Academy in Rome and the American School of Classical Studies in Athens, and its students have the privileges accorded to undergraduates from contributing institutions (use of the library at both schools and consultation with the staff). Swarthmore is also one of the institutions sponsoring the Intercollegiate Center for Classical Studies in Rome, which provides facilities for the study of Classics, Archaeology, and Ancient History. Classics majors, recommended by the Department, are eligible to study at the Center, usually during their junior year, either for one semester or for two. Students of the classics are eligible for the Susan P. Cobbs Scholarship and the Susan P. Cobbs Prize Fellowship (see pp. 24 and 63).

REQUIREMENTS AND RECOMMENDATIONS

Greek, Latin, or Ancient History may be offered as a major subject either in the Course Program or in the External Examination Program, and as a minor subject in the latter Program.

A student majoring in Greek or Latin in the External Examination (Honors) Program or in the Course Program should complete during the first two years either Intermediate Greek or Intermediate Latin.

In the Honors Program, a student majoring in Greek is also expected to study Latin through the intermediate level and a student majoring in Latin is expected to study Greek through the intermediate level before graduation.

Students minoring in either Greek or Latin in the Honors Program should complete during the first two years either Intermediate Greek or Intermediate Latin.

A major in Greek or Latin in the Course Program will consist of at least 8 courses in the appropriate language above the introductory level.

Students majoring in either the Honors Program or the Course Program are required to take for at least one semester a course in prose composition (Greek 9, 10, or Latin 9, 10).

In the Honors program, three or four papers constitute a major in Greek or in Latin. Normally all or all but one of these will be prepared for by seminars. Either Directed Reading in a field in which a seminar is not given (course 93), a thesis, or a course supplemented by additional independent work (i.e., an "attachment") may be used to prepare for the remaining paper. A minimum of two papers constitutes a minor in Greek or in Latin, at least one of which must be prepared for by a seminar.

A major in Ancient History will consist of (1) Classics 42, with attachments, (2) Classics 44, with attachments, and (3) either or both of the

3 Absent on leave, 1985-86.

following: Greek 113, Latin 102. The prerequisites for Classics 42 and 44 are Classics 21 or 31, and Classics 32. For Greek 113 the prerequisite is one year of Intermediate Greek; for Latin 102, one year of Intermediate Latin.

A minor in Ancient History will normally consist of (1) and (2) above, with the specified prerequisites.

Greek

1-2. Intensive First-year Greek.

Greek 1 (fall) imparts a basic knowledge of Ancient Greek grammar sufficient to equip the student to begin reading after one semester. It meets four days per week and carries 1½ credits. Greek 2 (spring) is an introduction to Greek literature. A major work of the Classical period is read, usually a dialogue of Plato. It meets four days per week and carries 1½ credits.

Year course. Rose.

9, 10. Greek Prose Composition.

Course meets one hour a week. A requirement for majors, this course is recommended in conjunction with courses at the intermediate level or above, to provide the student with grammatical and stylistic exercise.

Half course, one semester each year. Rose.

11. Intermediate Greek Reading.

The main reading is Plato's *Apology.*

Fall semester. Ostwald.

12. Homer.

Selections from either the *Iliad* or the *Odyssey* are read in Greek; the remainder of the poem is read in translation.

Spring semester. Staff.

19. Comparative Grammar of Greek and Latin.

A study of the phonology, morphology, and inflection of Greek and Latin words derivable from their common source, Proto-Indo-European. Students should have some knowledge of both Classical languages, but no prior experience in linguistics is assumed.

Given in alternate years.

Fall semester. Not offered 1985-86. Rose.

91. Special Topics.

Readings selected to fit the needs of individual seniors in preparation for their comprehensive examinations.

Spring semester. Staff.

93. Directed Reading.

A program of independent work under the supervision of the instructor. It is open only to advanced students and may be taken only with the consent of the Department chairman.

Staff.

95. Attachment.

Additional, independent work attached to an advanced course, normally used to prepare for an external examination, but available also to Course students for the purposes described on page 49 (Formats of Instruction).

Staff.

Latin

1-2. Intensive First-year Latin.

An intensive course in the essentials of Latin grammar aiming to provide sufficient knowledge of the language to make possible the study and appreciation of Latin literature.

The course meets four times a week and carries 1½ credits each semester.

Year course. Forsythe.

9, 10. Latin Prose Composition.

The development of Latin prose style is studied, with an analysis of Latin texts and extensive translation of English into Latin. A requirement for majors, it is recommended in conjunction with Latin 11 and Latin 12. The course meets one hour a week.

Half course. Forsythe.

11. Intermediate Latin: Catullus.

The study of Catullus is preceded by an intensive, three-week review of the funda-

mentals of the language, accompanied by readings in Latin prose.
Fall semester. North.

12. Intermediate Latin: Cicero.
An oration and selected letters. This course is designed to introduce students to a great historical and literary figure of the Roman Republic. It combines a study of his major political and literary achievements with a careful analysis of his prose style.
Spring semester. Staff.

13. Literature of the Augustan Age.
Fall semester. Not offered 1985-86.

14. Mediaeval Latin.
Works chosen from the principal types of mediaeval Latin literature (including religious and secular poetry, history and chronicles, saints' lives, satire, philosophy, and romances) are studied in this course.
Spring semester. North.

15. Comedy and Satire.
A play of Plautus and representative examples of Roman satire.
Fall semester. Forsythe.

91. Special Topics.
Readings selected to fit the needs of individual seniors in preparation for their comprehensive examinations.
Spring semester. Staff.

93. Directed Reading.
A program of independent work under the supervision of the instructor. It is open only to advanced students and may be taken only with the consent of the Department chairman.
Staff.

95. Attachment.
Additional, independent work attached to an advanced course, normally used to prepare for an external examination, but available also to Course students for the purposes described on page 49 (Formats of Instruction).
Staff.

Ancient History and Civilization

21. Ancient Greece.
Greek thought, literature, and history from the Homeric age to Plato, with emphasis upon the interrelationships between the intellectual currents and the social, economic, and political systems. Readings (in translation) include Homer, Herodotus, Thucydides, Greek tragedy and comedy, and Plato. Two lectures and one discussion session per week. Two credits, one in distribution group 2, one in group 3. Satisfies prerequisite requirement for Classics 42 and advanced courses in the Department of History. Counts as part of a major in History.
Fall semester. Burrell, Rose.

31. History of Greece.
The course is devoted to the study of the political and social history of the Greek states to the time of the Hellenistic kingdoms. Special attention is given to the 6th and 5th centuries B.C. Considerable reading is done in the primary sources in translation. Classics 31 meets the distribution requirement for Group 3; it counts toward a major in History, and also serves as prerequisite for advanced courses in History.
Fall semester. Not offered 1985-86. Ostwald.

32. The Roman Republic and Augustus.
A study of Rome from its foundation through the reign of Augustus (753 B.C.-A.D. 14). The following subjects will be considered in detail: (1) The evolution of the republican constitution, (2) Rome's wars of expansion, (3) The accompanying changes in Roman Society and economy, (4) The Roman Revolution, (5) The Augustan Principate.
Students will read the pertinent original sources in translation as well as a selection of modern viewpoints. There is no prerequisite. This course meets the distribution requirement for Group 3; it counts toward a major in History, and also serves as prerequisite for advanced courses in History.
Spring semester. Forsythe.

33. Greek Literature in Translation.
The works studied in this course range in time from Homer to Plato and Aristotle and include selected masterpieces of epic, lyric and elegiac, and dramatic poetry, history, and philosophy.

Lectures on the historical and cultural context supplement class discussion.
Not offered 1985-86.

35. Latin Literature in Translation—Classical and Mediaeval.

The works studied in this course range in time from the age of the Roman Republic to the twelfth century after Christ. They include the major authors of the classical period, St. Jerome and St. Augustine from the Latin Fathers, and from the Middle Ages, Boethius, Prudentius, the chief figures of the Carolingian Renaissance, and the writers of Mediaeval Latin hymns and secular poetry.
Fall semester. Not offered 1985-86. North.

36. Classical Mythology in Literature and Art.

A study of selected myths in works of Greek and Latin literature ranging from Homer's *Odyssey* to the *Metamorphoses* of Ovid and Apuleius. Attention is given not only to works of art inspired by mythical figures and cycles, but also to ancient sites connected with them. Given in alternate years.
Fall semester. Not offered 1985-86. North.

37. Topics in Greek and Roman Religion.

A study of selected issues basic to the understanding of religion in ancient society: the gods, representative cults, festivals, and rituals, beliefs about the afterlife, types of sacrifice, oracles and prophecy, the interaction of philosophy and religion, and the social context of early Christianity. There are no prerequisites. Readings are in translation.
Fall semester. North.

42. Greece in the Fifth Century B.C.

An intensive study, chiefly on the basis of primary sources, of Athens and the Greek world from the reforms of Cleisthenes to the end of the Peloponnesian War. Special emphasis is placed on the political, social, and economic institutions of the Athenian democracy and on the problems of the Delian League, both internal and in its relation to the Greek and non-Greek world. Classics 42 counts toward a major in History.
The course is normally given in alternate years.
Prerequisite: Classics 31 or its equivalent.
Spring semester. Ostwald.

44. The Early Roman Empire.

A detailed study, using primary sources, of the political, economic, social, and cultural history of the Roman world from the fall of the Republic through the Antonine Age (50 B.C.-A.D. 192). Classics 44 counts toward a major in History.
Prerequisite: Classics 32 or its equivalent.
Fall semester. Not offered 1985-86. Burrell.

45. Greek Political Theory.

A study of Greek political concepts and institutions as a background to the political thought of Thucydides, Plato, and Aristotle, on which the major attention of this course is focused.
Spring semester. Not offered 1985-86. Ostwald.

51. An Introduction to Archaeology.

This course focuses on the discipline of archaeology and its place in the wider fields of the humanities and social sciences. Among the topics covered will be field techniques, methods of dating, analysis of archaeological data and problems of interpretation.
Cross-listed as Sociology and Anthropology 51.
Fall semester. Burrell.

52. Greek Archaeology.

This course traces the development of Greek civilization as documented by archaeology, and includes data ranging from pottery and coins to monumental art and architecture.
Spring semester. Not offered 1985-86. Burrell.

53. Roman Archaeology.

This course documents the rise of Rome from a small village of huts on the Tiber River to the capital and showplace of a great empire, using the evidence of material remains from that city and from diverse sections of the Roman world.
Spring semester. Burrell.

54. The Art and Science of Ancient Coins.

With the assistance of actual coins from the Swarthmore collections, students learn numismatic techniques and how to apply them to problems of history, economy, and stylistic development. They are also encouraged to choose a special topic to present in class. Because of the difficulties in presenting such small objects, enrollment will be limited to 10.
Spring semester. Not offered 1985-86. Burrell.

82. The Ancient Theatre.

A representative selection of Greek and Roman drama, both tragedy and comedy, will be read in translation, together with the *Poetics* of

Aristotle, and there will be a study of ancient dramatic production and the physical remains of Greek and Roman theatres.
Given in alternate years.
Spring semester. Not offered 1985-86. North.

91. Special Topics.
Readings selected to fit the needs of individual seniors in preparation for their comprehensive examination in Ancient History.
Spring semester. Staff.

93. Directed Reading.
A program of independent work under the supervision of the instructor. It is open only to advanced students and may be taken only with the consent of the Department chairman.
Staff.

95. Attachment.
Additional, independent work attached to an advanced course, normally used to prepare for an external examination, but available also to Course students for the purposes described on page 49 (Formats of Instruction).
Staff.

SEMINARS

102. The Age of Nero.
This seminar will study a range of Silver Latin authors writing about the reign of Nero (Tacitus, Suetonius, Seneca). The value of the works as historical evidence and their literary merits will be considered.
Fall semester. Burrell.

103. Latin Epic.
This seminar is devoted to one or more of the following: Lucretius' *De Rerum Natura*, Virgil's *Aeneid*, Ovid's *Metamorphoses*.
Spring semester. Not offered 1985-86. North.

105. The Age of Cicero.
This seminar will focus primarily on Cicero's speeches, letters, and philosophical works in the context of the history and thought of the final years of the Republic. In addition, works of Sallust and Caesar will be studied for their historical evidence and their differing prose styles.
Fall semester. Not offered 1985-86. Turpin.

107. Horace: Lyric and Hexameter Poetry.
The seminar emphasizes the *Odes* and *Epodes* and their place in the tradition of Greek and Roman lyric poetry. Attention is also given to the *Satires* and *Epistles*, especially the *Ars Poetica*, and to their importance for the history of satire and literary criticism. An effort is made to grasp the totality of Horace's achievement in the context of the Augustan Age.
Spring semester. North.

111. Greek Philosophers.
This seminar is devoted mainly to the study of Plato, which is supplemented by study of the pre-Socratic philosophers and of Aristotle and the Hellenistic schools. The orientation of the seminar is primarily philosophical, although the literary merits of the Greek philosophers receive consideration.
Fall semester. Ostwald.

112. Greek Epic.
This seminar will study primarily Homer's *Odyssey*. Selections from Hesiod and Apollonius will also be read, with some attention to the development of Greek epic.
Spring semester. Not offered 1985-86. Rose.

113. Greek Historians.
This seminar is devoted to a study of Herodotus and Thucydides, both as examples of Greek historiography and as sources for Greek history.
Fall semester. Not offered 1985-86. Ostwald.

114. Greek Drama.
The whole body of extant Greek tragedies and comedies is studied, with a careful reading in the original language of one play by each of the major dramatists.
Spring semester. Rose.

115. Greek Elegiac and Lyric Poetry.
The whole body of extant Greek elegy and lyric is studied, with attention to the political and social background, and to the relation of these literary types to epic and dramatic poetry.
Fall semester. Not offered 1985-86. Ostwald.

Computer Science

CHARLES F. KELEMEN, Professor and Program Director [12]
MARGARET CHRISTENSEN, Lecturer

Computer Science is the study of algorithms and the issues involved in implementing them. This includes the study of computer systems, methods to specify algorithms (for people and computer systems), and the formulation of theories and models to aid in the understanding and analysis of the properties of algorithms, computing systems, and their interrelationship.

The Computer Science Program is designed to provide students with a flexible set of offerings in computing that can be tailored to satisfy interests in various areas and at several levels of depth. All the courses emphasize the underlying, fundamental concepts of computer science, treating today's languages and systems as current examples of the underlying concepts.

Students from any discipline who are interested in an introduction to computer science should take CS 15: Introduction to Computer Science. For a deeper, more formal introduction, they should continue with Math 9: Discrete Mathematics, and CS 35: Fundamental Structures of Computer Science. Students with sufficient previous experience in computer science may skip CS 15 by passing a placement exam. The concentration in computer science is designed for students who desire a coherent introduction to the core topics in the field. Students completing the concentration will possess a number of intellectual skills useful in many disciplines.

CONCENTRATION IN COMPUTER SCIENCE

The concentration in computer science can be combined with any major in the college. It will provide students with a well-rounded background in computer science sufficient to allow them to develop significant, creative applications in their major area of interest and to keep up with the rapid changes in the field of computer science. Students interested in a Concentration in Computer Science should submit a concentration proposal for approval by the Computer Science Committee by the end of their sophomore year. Both the student's major advisor and the Director of the Computer Science Program should be consulted when writing such a proposal. While some flexibility is possible, the requirements for the concentration in computer science will usually consist of six courses selected as follows:

Each of: CS 15: Introduction to Computer Science; Math 9: Discrete Mathematics; CS 35: Fundamental Structures of Computer Science. Two of: Engin 22: Computer Organization; CS 41: Data Structures and Algorithms; CS 43: Foundations of Programming Language Design; CS 46: Theory of Computation.

One of: the remaining courses from the category above (i.e., CS 41, 43, 46, or Engin 22); Engin 25: Laboratory Computer Applications; CS 56: Foundations of Concurrent Programming and Operating System Design; CS 63: Artificial Intelligence; Math 67: Numerical Methods; Math 73: Mathematical Algorithms; CS 75: Principles of Compiler Design and Construction; CS 91: Special Topics in Computer Science; CS 93: Directed Reading or Project.

Note: In certain cases, especialy well-prepared Engineering students may be permitted to substitute Engin 11 and Math 16 for CS 15 and Math 9.

A comprehensive experience is also required. This requirement may be satisfied by passing a comprehensive examination administered by the Computer Science Committee or by completing a senior paper and/or project relating computer science and the student's major. With the approval of appropriate committees,

12 Joint appointment with mathematics.

such a project may be used to satisfy more than one comprehensive requirement. For example, appropriate Engineering 90 projects may be used to satisfy the comprehensive requirements for both an Engineering major and a Computer Science concentration.

SPECIAL MAJORS

Students desiring to integrate computer science with another discipline or with several disciplines in a more formal manner are encouraged to develop a Special Major combining computer science and the other area(s). Such Special Majors are subject to the approval of both the student's major department and the Computer Science Committee and should be developed in consultation with the director of the computer science program and the chairman of the other department envolved. These consultations should be carried out as early in the student's program as possible. While considerable flexibility is possible, in most cases the computer science part of such a Special Major will have the same requirements as the concentration except that the senior paper and/or project will be taken for one or two credits.

MINORS FOR EXTERNAL EXAMINATION

For students electing to take a minor in Computer Science under the external examination requirements, the Computer Science Committee may, in some cases, approve certain combinations of two computer science courses to constitute a two-credit paper.

GRADUATE STUDY

Students interested in graduate study in Computer Science will be well prepared by majoring in Mathematics or Engineering and completing selected Computer Science courses. The choice of the appropriate major and computing courses will depend on the student's interests and should be made in consultation with the director of the Computer Science Program. Other majors are also reasonable for students with special interests. For example, a major in Linguistics or Psychology might be appropriate for a student interested in artificial intelligence. In such cases, students should consult as early as possible with the director of the program in order to be sure of taking the mathematics and computing courses necessary to be prepared for graduate work in Computer Science.

COMPUTER SCIENCE COURSES

(Courses numbered above 40 will be offered in alternate years.)

15. Introduction to Computer Science. This course is an introduction to computer science for students from all disciplines. The major emphasis of the course is on problem solving and algorithm development. Students are introduced to the Pascal programming language and gain proficiency in it by writing programs to solve a number of illustrative problems. Students are also informally introduced to many topics in computer science including: hardware organization; system software; programming style and documentation; program testing and verification; fundamental data structures such as arrays, records, and linked lists; basic algorithms for searching and sorting; analysis of algorithms; computability;

and artificial intelligence.
Prerequisite: Computing from the User's End (Physics 5) or its equivalent.
Each semester. Staff.

35. Fundamental Structures of Computer Science.

This course completes the broad introduction to computer science begun in CS 15 and provides a general background for further study in the field. Topics to be covered include: data structures (linked lists, trees, etc.) and algorithms, organization of computer systems and assembly language programming, an introduction to the theory of computation and formal languages, and alternative programming languages. A brief survey of areas of research interest in computer science will also be presented. Students will be expected to complete a number of programming projects illustrating the concepts presented.
Prerequisites: CS 15 and Math 9. In some cases, with the permission of the instructor, Engin 11 and Math 16 can be substituted.
Each semester. Kelemen.

41. Data Structures and Algorithms.

This course is a continuation of the study of the basic data structures and algorithms found to be useful in many diverse areas. This study was begun informally in CS 15 and continued in CS 35. The approach here is more formal both with respect to the correctness of the algorithms and with respect to the time and space resources required for the various algorithms and their associated data structures. Topics to be covered include: abstract data types, arrays, pointers, linked lists, stacks, queues, trees (including balanced trees), graphs, searching and sorting, and algorithms and data structures appropriate for external storage media like magnetic disks and tapes. The impact of several models of parallel computation on the design of algorithms and data structures will be presented. Students will be expected to complete several programming projects in the course.
Prerequisite: CS 35.
Alternate years. Next offered fall semester 1986.

43. Foundations of Programming Language Design.

A study of the organization and structure of modern programming languages with an emphasis on semantic issues. Topics include: specifying syntax and semantics, conventional and abstract data types, control structures, procedural languages, functional languages, other classes of languages, program correctness, concurrency and synchronization, language design and evaluation, implementation issues.
Prerequisite: CS 35.
Alternate years. Fall semester. Kelemen.

46. Theory of Computation.

The study of various models of computation leading to a characterization of the kinds of problems that can and cannot be solved by a computer and, for those problems that can be solved, a means of classifying them with respect to how difficult they are to solve. Topics to be covered include: formal languages and finite state devices, Turing machines and other models of computation, computability, and complexity.
Prerequisite: CS 35.
Alternate years. Spring semester. Kelemen.

56. Concurrent Programming and Operating System Design.

This course introduces the issues involved in programming and synchronizing several processes that will run concurrently. It also presents the concepts found to be important in the design of modern operating systems. A small operating system will be designed in the course and students will have the opportunity to modify the design and implement the operating system using appropriate high level tools. Topics to be covered include: specification of concurrency, synchronization and communication primitives, monitors, memory management (including virtual memory), scheduling, process management, and file systems. A brief survey of concurrent programming languages and current operating systems will be presented.
Prerequisite: CS 35.
Alternate years beginning fall semester 1987.

63. Artificial Intelligence.

This course will emphasize many of the basic abstractions and algorithms found to be useful in the field of Artificial Intelligence. Topics will include: production systems; search strategies including heuristic searching and applications to game playing; the predicate calculus and automated reasoning including applications to robot planning and expert systems; an introduction to some of the computational ap-

proaches to knowledge representation, natural language understanding, and learning. While the emphasis of the course will be on ideas and algorithms, students will be exposed to the programming languages LISP and PROLOG and expected to implement several Artificial Intelligence programs in these languages.
Prerequisite: CS 35.
Alternate years. Next offered spring semester 1987.

75. Principles of Compiler Design and Construction.

This course presents an introduction to the design and construction of language translators for procedure oriented programming languages. Topics include: formal grammars, lexical analysis and finite automata, syntax analysis and pushdown automata, LL and LR parsing, semantic analysis and table handling, error detection and recovery, code generation and optimization, compiler writing tools. There will be an ongoing programming project that will culminate in a compiler for a small but not trivial programming language.
Prerequisite: CS 35 and permission of the instructor.
Alternate years. Next offered fall semester 1986.

91. Special Topics in Computer Science.

Subject matter dependent on a group need or individual interest. Normally restricted to senior students and only offered when staff interests and availability make it practicable to do so.
Prerequisite: permission of the instructor.

93. Directed Reading or Project.

With the permission of a staff member who is willing to supervise it, a qualified student may undertake a program of extra reading and/or a project in an area of computer science as an extension of one of his or her courses.

Economics

ROBINSON G. HOLLISTER, JR., Professor and Chairman
HOWARD PACK, Professor
FREDERIC L. PRYOR, Professor (part-time)[3]
BERNARD SAFFRAN, Professor[1]
F. M. SCHERER, Professor[3]
LARRY WESTPHAL, Professor
STEFANO FENOALTEA, Visiting Professor[5]
MARK KUPERBERG, Associate Professor
STEPHEN S. GOLUB, Assistant Professor[1]
PAUL F. RABIDEAU, Instructor
HOWARD WIAL, Instructor[4]
CHARLES F. STONE III, Lecturer[4]
WILLIAM J. STULL, Visiting Lecturer[4]
JACK TOPIOL, Visiting Lecturer[5]

The courses in economics have three main goals: (1) to provide insight into the processes and accompanying institutions through which productive activity is organized; (2) to develop a set of tools for analyzing economic processes and institutions; and (3) to build a foundation for reaching informed judgments on issues of public policy.

Economics 1-2 or its equivalent is a prerequisite to all other work in the Department. Both semesters must be successfully completed for credit to be obtained.

All majors in economics must take Economics 4 (Statistics for Economists) or its equivalent such as Mathematics 13 or 23 (Mathematics 1-2 does not meet the requirement). The Statistics for Economists course focuses mainly upon the application of statistical tools to economic problems; the Mathematics Department statistics courses emphasize the properties of statistical estimators.

In order to read the literature in economics critically, a knowledge of elementary calculus is extremely helpful. We strongly recommend that students take Mathematics 5 and 6 (differential and integral calculus) or equivalent. Math 16 and 18 are useful for persons intending to focus on the more technical aspects of economics.

Students contemplating careers in international economics or business are also strongly advised to have a mastery of at least one modern foreign language.

To graduate as a major in course, students must have at least eight credits in economics, must meet the statistics requirement, and must pass the comprehensive examination given in the Spring semester of their senior year. To be prepared for the comprehensive, course students must complete Economics 20 and Economics 59 *before* the second semester of their senior year.

1-2. Introduction to Economics.
This course is designed both to afford the general student a comprehensive survey and to provide students doing further work with a foundation on which to build.

The first semester course describes the organization of the economic system and analyzes the

1 Absent on leave, fall semester, 1985.
3 Absent on leave, 1985-86.
4 Fall semester, 1985.
5 Spring semester, 1986.

allocation of resources and the distribution of income.
Fall semester.

The second semester course deals with the problems of inflation, unemployment, monetary and fiscal policy, the determination of national income, and international economic relations.
Spring semester.
Students must take Economics 2 to receive credit for Economics 1.

3. Accounting

The purpose of this course is to equip the student with the rudiments of accounting needed for advanced work in business finance, banking, taxation, and public regulation. (This course does not satisfy the distribution requirements as outlined previously in this catalogue.)
Spring semester. Topiol.

4. Statistics for Economists.

The primary focus of this course is on the understanding of how simple and multiple regression can be used to estimate magnitudes in economic relationships, e.g. elasticities, and tests of hypotheses about these magnitudes. The course also covers elements of probability, sampling distributions, and decision theory. No mathematic prerequisite except high school algebra. An introduction to selected elements of calculus and linear algebra used for quantitative methods in economics is contained in the course. As this course will include problem solving using the computer, students taking it must also take Economics 5 (unless they have taken or are taking the equivalent course in other disciplines).
Fall semester. Hollister.

5. Computing from the User's Point of View.

(Also listed as Mathematics 6A and Physics 5.) This course provides an introduction to, and immediate use of, a wide range of computing functions. No previous experience in computer use is necessary. Lectures are one hour per week and supervised workshop sessions are two hours per week. In the workshop students apply computing procedures directly to problems of economic analysis. Computing topics introduced are: text and file creation and editing, runoff, graphics, simple programming techniques, statistical packages, bibliographic search, and data base handling. ½ unit.
Fall semester. Boccio, Hollister.

6. Graphics, Modeling and Simulation.

(Cross-listed as Physics 40). This course is designed to introduce students to the use of sophisticated graphics, modeling, and simulation software. Included in topics covered are: FORTRAN 77, techniques of graphics for modeling and simulating complex economic, biological, environmental, societal, and physical systems. Use will be made of the graphics software subroutine package DISSPLA, the modeling/simulation software package DYNAMO, and color graphics terminals.
Spring semester.

11. Economic Development.

Peasant economic responses, agricultural and industrial technology, interaction between rural and urban sectors, analysis of international terms of trade, export instability, the new international economic order, import substitution, the role of multinational corporations, foreign aid, political factors.
Spring semester. Pack.

12. Econometrics.

A survey of fundamental econometric methods emphasizing application. Some empirical work will be required.
Prerequisite: Economics 4.
Spring semester. Not offered 1985-86.

15. Investments.

This course will deal with the operation of financial markets from three different perspectives. First, from the viewpoint of the individual investor, investment alternatives and strategies will be studied, with special emphasis on the stock market. The second perspective will be that of a business enterprise. Key topics here are the capital budgeting decision and alternative sources of capital. Third, from a public policy viewpoint certain issues concerning the link between financial markets and resource allocation will be studied. Two specific issues in this category are (1) the connection between the stock market and capital formation, (2) housing and finance.
Fall semester. Rabideau.

16. Women in the Economy.

Four major themes will be explored in this course. The first relates to the unpaid work performed by women in the home. We will

examine the nature of the family as an institution, changes in the nature of unpaid household work, the "value" of such work, and the social status accorded it. The other major topics are concerned with the labor market experiences of women. After a thorough discussion of alternative economic theories of the labor market (no prior knowledge of this topic is assumed) and of economic approaches to discrimination, we will consider (1) why so many women are working for pay (labor supply/labor demand), (2) why so many women are clerical workers (occupational segregation), and (3) why so many women earn substantially less than men (wage differentials).
Spring semester. Not offered 1985-86.

18. Money, Banking, and the Economy.

This course will examine the behavior of financial markets and their connection to real economic activity, using a combination of analytical and institutional perspectives. Among the topics to be considered are (1) the structure of U.S. financial markets: the bankng system, the bond and stock markets, etc.; (2) the Federal Reserve System and the conduct of monetary policy; (3) monetarism; (4) interest rates, monetary policy, and inflation; (5) rationality and irrationality in financial markets; (6) international financial relations; the Eurodollar market, the foreign exchange market, and international lending.
Spring semester. Golub.

19. Economics of the Environment and Natural Resources.

Micro and macroeconomic theory applied to problems of the environment and natural resources. Long run implications of resource use for economic growth, evaluation of alternative uses of natural environment and methods of pollution control. Government response to situations involving externalities, public goods and common property resources. Case studies of air pollution, recreation versus mineral or fuel development on public lands, the fishing industry and offshore petroleum development.
Fall semester. Not offered 1985-86.

20. Economic Theory.

Microeconomic theory at an intermediate level. Determination of prices in theory and in practice. Distribution of income. Economic welfare aspects of various market structures. Other selected topics. This course may be offered in two sections: one section will meet once a week in a problem-oriented seminar format, the other section will meet twice a week in a lecture/discussion format.
Fall semester. Pack.

22. Public Finance.

Introduction to welfare economics including the role of the market in allocating resources and distributing income, market imperfections, and public choice theory. Analysis of tax and expenditure policies on economic efficiency and the income distribution. Special topics include cost-benefit analysis and general equilibrium tax incidence.
Spring semester. Saffran.

24. The Economics of Industry.

Through a series of case studies, the strategic responses of firms and industries to their market and policy environments are analyzed. Emphasis is on the pricing, technological innovation, and marketing behavior of firms and on such government policy instruments as import restrictions, price controls and subsidies, antitrust, and patent policy.
Fall semester. Not offered 1985-86.

25. Labor Problems and Manpower Policy.

The structure and behavior of labor markets, issues in labor relations, the development of manpower, the role of unions, employers, and government.
Fall semester, Not offered 1985-86.

26. Social Economics.

The extent, consequences, and causes of poverty and economic inequality; an appraisal of reforms in income support programs, medical care, education, housing, and rural and ghetto development; the economics of discrimination.
Not offered 1985-86.

27. Government Regulation of Industry.

This course analyzes the logic and effectiveness of various regulatory instruments by which the government seeks to affect the structure and performance of major industries. The principal topics will be antitrust policy, economic regulation of natural monopoly industries, regulation and deregulation of industries blending monopoly and competitive elements, and the "social" regulation of pollution, occupational safety, and comsumer information.
Fall semester. Stone.

28. Technological Change and Economic Growth

An exploration of how technological change affects economic growth, with emphasis on such institutions as academic science and industrial research and development. Covers production function analysis, induced innovation, the patent system, government R&D program conduct, and macrodynamic phenomena.

Spring semester. Not offered 1985-86.

30. The International Economy.

The course consists of a brief introduction to the historical development and institutional structure of the international economy and an introduction to the theory of trade, commercial policy, and balance of payments adjustment. These tools are used to analyze contemporary international economic problems; tariffs and non-tariff barriers, common markets, multinational corporations, international oil, gold, inflation, and the future of the international monetary system.

Spring semester. Golub.

31. Comparative Economic Systems.

This course focuses on the methods by which different economic systems can be analyzed. Considerable attention is paid to the structure and performance of nations with different economic systems and on the origins of selected economic institutions. Particular emphasis is placed on the study of the Soviet Union, China, and Yugoslavia. Methods of drawing inferences using the comparative method are explored.

Fall semester. Not offered 1985-86.

41. Urban Economics and Public Policy.

This course analyzes the structure and evolution of urban economies in the United States. It takes the representative American city as the primary unit of analysis and shows how it has evolved through time as a result of the interaction of socioeconomic forces, technological change, and public policy. The role of government in this process is examined in depth, with emphasis on the policy areas of housing, land use control, transportation, and public finance. Particular attention will be paid throughout the course to the historical experience of Philadelphia.

Fall semester. Stull.

42. Health Policy.

(Also listed as Political Science 42.) Analysis of government policy toward health care and public health, its impact upon institutions and resource allocation, and major alternatives for action. Central topics are the organization of health care delivery (roles and views of physicians, nurses, administrators, patients and insurers); the interplay of federal, state, and local governments, quasi-public authorities, and interest groups; technical and political aspects of health insurance alternatives; health manpower (medical and nursing schools, paraprofessionals); biomedical research programs. Students wishing to take this course should consult in advance with the instructors. Prior work in at least two of the following will be helpful: Economics 1-2, 4, 26; Political Science 2, 51; Mathematics 1; Engineering 4, 32.

Fall semester. Not offered 1985-86.

47. Political Economy.

This course examines non-neoclassical approaches to political economy, with emphasis on the Marxian approach. It also compares the Marxian and neoclassical approaches to the study of the economy, the state, and the relationship between the economy and the state. Topics include: the basic concepts of Marxian analysis (e.g., historical materialism, modes of production, theories of value and exploitation), social classes in contemporary capitalism, the organization of work, income distribution, the behavior of the state, business cycles, inflation and unemployment, economic growth and economic crises in advanced capitalist economies, and the relationship between the United States and world economies. Prerequisites: Economics 1-2 or equivalent courses on Marxian analysis in other disciplines.

Fall semester. Wial.

48. Economics, Justice, and Law.

The purpose of this course is to explore the premises behind the use of utilitarian constructs in the analysis of public policy issues. In particular, the appropriateness of the growing utilization of economic methodology will be examined through an intensive study of issues in law and distributive justice. The necessary background in welfare economics will be developed as needed.

Fall semester. Kuperberg.

49. American Economic History.

Survey of American economic development from the colonial settlement to the New Deal. Explores the transition from a colonial system, based on agricultural exports within the mercantile system, to an advanced, industrialized economy supported by a vast internal market. Emphasis on i) the role of agriculture in the process of economic development, in particular a comparative analysis of the plantation system of the South and the system of family farming in the North, ii) the changing industrial structure after the Civil War as a consequence of the growth of the large-scale, vertically integrated corporation, and iii) the political and social bases of economic development, with particular attention to the American Revolution, the Civil War, the new Deal and the evolution of the legal system, and the political responses to industrialization.
Prerequisites: Economics 1-2, History 5 or 6, or permission of the instructor.
Fall semester. Not offered 1985-86.

50. Western Economic History.

This course examines the evolution of the economy from prehistory to our own time. It surveys demographic, agricultural, industrial, commercial, technological, and organizational developments; and it uses economic analysis to explore their interconnections.
Spring semester. Fenoaltea.

57. Operations Research.

(Also listed as Engineering 57.) The principles of operations research as applicable to defining optimum solutions of engineering and financial problems as an aid to managerial decision making. Probability and probability distributions, reliability, random number simulation, queuing theory, linear programming, dynamic programming, allocation and transportation theory. The working principles of engineering economy are introduced and combined with operations research topics. Normally for junior and senior students.
Fall semester. Friesz.

59. Macroeconomic Theory and Stabilization Policy.

The theory of the determination of the level and composition of aggregate output, employment, prices and interest rates. Analysis of conflicting views of the relationship between inflation and unemployment and of the proper role of government stabilization policy.
Spring semester. Kuperberg.

65. The Evaluation of Public Policies

The methods used for systematic, quantitative evaluations of the effects of public policies, the problems in implementing such evaluations, and the use of such evaluations in policy decision-making. Examples are drawn from evaluations of social policies such as employment and training, welfare reform, health insurance, housing allowances. The use of large social experiments as a method of policy evaluation receives particular attention. Students will work directly with data taken from actual major evaluations of policies and social experiments.
Prerequisite: at least one course in statistics.
Spring semester. Not offered 1985-86.

67. Social Insurance and Welfare Policy.

(Also listed as Political Science 67.) The principal American policies and programs dealing primarily with relief of poverty and economic insecurity, and the prospects and options for reform in this field. Topics include: Social Security, national health insurance, unemployment compensation, and welfare reform. The various public objectives and methods of income support and related social services, as well as certain contextual or alternative programs and regulatory policies. Conceptions of "welfare"; economic, social, political, and administrative or professional considerations in policy; historical and comparative perspectives. Intended as a single- or double-credit seminar for students in the Public Policy Concentration and open for single credit to others who have taken appropriate Public Policy prerequisites, on which consult the Catalogue and, as to exceptions, one of the instructors.
Spring semester. Not offered 1985-86.

73. History of Economic Thought.

An examination of classical political economy (Smith and Ricardo) and Marx with emphasis on the origins of economic analysis in the tradition of political theory and the structure and development of classical thought.
Prerequisites: Economics 1-2 or permission of the instructor.
Fall semester. Not offered 1985-86.

81. Economics of the Middle East.
Study of selected Middle Eastern economies. Focus on different economic development strategies of countries, some with limited and others with substantial natural resource bases. Investigation of agricultural and industrial policies, issues in natural resource pricing, and technology absorption problems.
Fall semester. Pack.

91. Political Economy of Macroeconomic Policy.
(Also listed as Political Science 69.) Focus on the congressional and administrative processes by which macroeconomic policy is formulated, approved, and implemented.
Spring semester. Pack and Gilbert.

93. Directed Reading.
With the consent of a supervising instructor, individual or group study in fields of interest not covered by regular course offerings.
Fall or spring. Staff.

SEMINARS

101. Public Finance.
Introduction to welfare economics, including the role of the market in allocating resources and distributing income, market imperfections and public choice theory. Analysis of tax and expenditure policies on economic efficiency and the income distribution. Special topics include cost-benefit analysis, general equilibrium tax incidence and optimal tax theory.
Spring semester. Saffran.

102. Macroeconomic Theory and Stabilization Policy
The theory of the determination of the level and composition of aggregate output, employment, prices and interest rates. Analysis of conflicting views of the relationship between inflation and unemployment and of the proper role of government stabilization policy. Special topics include microfoundations of macroeconomics and economic growth.
Spring semester. Kuperberg.

103. Economic Theory.
This seminar provides the theoretical background for the more advanced economic theory seminars. Both microeconomics (8 weeks) and macroeconomics (6 weeks) are covered.
Fall and spring semesters. Westphal, Saffran.

104. Topics in Advanced Theory.
This seminar will examine in depth selected topics, generally involving the application of economic theory to real-world problems. The topics will be selected jointly in advance by the instructor and participants. Topics under consideration include benefit/cost analysis, risk assessment, and computable general equilibrium models. Interested students should contact the instructor not later than November of the preceding semester.
Spring semester. Westphal.

105. International Economics.
Theory and policy of international economic relations. The theory of international trade and balance of payments adjustment. Commercial policy of tariffs and non-tariff barriers. Common markets, customs unions, and regional economic integration. Multinational enterprise and economic imperialism. The world monetary system, international inflation, and the international economics of oil.
Spring semester. Golub.

106. Comparative Economic Systems.
This seminar focuses on the methods by which economic systems can be analyzed. Considerable attention is paid to the structure and performance of nations with particular economic systems. Special case studies are made of the U.S.S.R., China, and Yugoslavia; briefer case studies are made of several capitalist economies of Western Europe. Causal forces underlying the origins and development of particular economic institutions are also discussed. The seminar also covers questions of convergence of important economic institutions, influences of ideology on the operation of the system, and forces underlying changes in both capitalist, market and socialist, centrally administered economies.
Fall semester. Not offered 1985-86.

107. Labor and Social Economics.

Economic analysis of the organization of labor and labor markets; education, medical care, housing, discrimination. Determinants of wages and income inequality, government policies with respect to labor relations, health, education, and welfare.

Spring semester. Hollister.

108. Econometrics.

Econometric theory and empirical studies. An empirical research paper is required.

Prerequisites: Mathematics 6 and Economics 103.

Fall semester. Hollister.

109. Economic Development.

Peasant economic responses, agricultural and industrial technology, interaction between rural and urban sectors, analysis of international terms of trade, export instability, the new international economic order, import substitution, the role of multinational corporations, foreign aid, political factors.

Fall semester. Pack.

110. Urban Economics.

This seminar will deal in depth with the structure and development of American urban economies. Topics covered will include housing, transportation, urban renewal, local government finance, and pollution. Methodological as well as substantive issues will be discussed.

Spring semester. Not offered 1985-86.

111. Industrial Organization and Public Policy.

Applications of theoretical and empirical analysis to major issues in industrial economics: optimality and the price system; theories of the firm; market structure; the causes of market failure and alternative policy responses.

Fall semester. Stone.

112. Mathematical Economics.

Review of static optimization theory; theory of consumption and production from a dual point of view; elementary approaches to the existence, stability, and optimality of general equilibrium; additional topics of student interest as time permits.

Spring semester. Not offered 1985-86.

114. History of Economic Thought.

A survey of the development of economic science from post-Mercantilist writers (Steuart and Quesnay) to Keynes. Permission of instructor required.

Fall semester. Not offered 1985-86.

115. Economic History.

This seminar surveys demographic, agricultural, industrial, commercial, and organizational developments in the Western economy from prehistory to our own time. Special attention is devoted to topics exemplifying the methodological contributions of the "new economic history."

Spring semester. Fenoaltea.

180. Thesis.

With the consent of a supervising instructor, honors majors may undertake a senior thesis for double credit.

Fall and spring semesters. Staff.

Education

EVA F. TRAVERS, Associate Professor and Program Director
K. ANN RENNINGER, Assistant Professor[3]
LISA SMULYAN, Assistant Professor
USHA BALAMORE, Lecturer

The Program in Education has three purposes: to expose students to issues in education from a variety of disciplinary perspectives, to provide a range of field experiences for students who wish to explore their aptitude and interest in teaching, counseling or research in an educational setting, and to prepare students to be certified for entry into public school teaching. Courses in the Program in Education are intended to be integral to the College's academic offerings. The Program's most important goal is to help students learn to think critically and creatively about the process of education and the place of education in society. To this end, both its introductory and upper level courses necessarily draw on the distinctive approaches of Psychology, Sociology, Anthropology, Political Science, Philosophy, and History. Because students major in one of the traditional disciplines, courses in Education offer both an opportunity to apply the particular skills of one's chosen field to a new domain and interaction with other students whose disciplinary approaches may differ significantly from their own.

A competency-based program for preparing secondary teachers is offered for students who seek public school certification from the Commonwealth of Pennsylvania. Competency is judged by an interdisciplinary committee of the faculty whose members have established criteria for certification in Biology, Chemistry, English, French, German, Mathematics, Spanish, and Social Studies. Individual programs are developed in conjunction with departmental representatives and members of the Education staff. There is no major in Education. All students seeking certification must meet Swarthmore College's general requirements for course distribution and a major.

REQUIREMENTS FOR TEACHER CERTIFICATION

Students planning to seek secondary certification should take Introduction to Education, Educ. 14, by the end of their Sophomore year and enroll for Practice Teaching, Educ. 16 (a double credit course) and Curriculum and Methods Seminar, Educ. 17, no earlier than the Spring Semester of the Junior year. In addition, they must complete the following sequence of courses:

- Educational Psychology, Educ. 21
- Child Development, Psychology 39, or Adolescence, Educ. 23
- An additional course from the following:
  a. Adolescence, Educ. 23
  b. Counseling: Principles and Practices, Educ. 25
  c. Women and Education, Educ. 31
  d. Education and Society, Educ. 47
  e. Education in America, Educ. 52
  f. Political Socialization and Schools, Educ. 64
  g. Urban Education, Educ. 68
  h. Special Topics, Educ. 91

Students preparing for certification must attain at least a grade point average of C in courses in their major field of certification and a grade of C+ or better in Introduction to Education in order to undertake Practice Teaching. In addition, students must be recommended by their major department and by their cooperating teacher in Introduction to Education. Placement of students in schools for Practice Teaching is contingent on successful interviews with members of the Education Program staff and appropriate secondary school personnel.

3 Absent on leave, 1985-86.

Education

Swarthmore College is not authorized by the Commonwealth of Pennsylvania to certify elementary teachers. However, students taking courses in the Education Program have an opportunity to concentrate their field work in an elementary setting and may do practice teaching for credit in an elementary school. Placements for students who do not desire certification are also available in a variety of special education or counseling settings.

14. Introduction to Education.

A survey of issues in education within an interdisciplinary framework. The first half of the course examines the teaching/learning process from the perspective of individuals such as Dewey, Skinner, and Bruner. The second half of the course explores major political, historical, and sociological questions in American education and discusses alternative policy options and programs. The course provides students with an opportunity to determine their own interest in preparing to teach, as well as furnishes them with first-hand experience in current elementary and secondary school practice. Field work is required.
Each semester. Staff.

16. Practice Teaching.

Supervised teaching in either secondary or elementary schools. Double credit. Students seeking secondary certification must take Education 17 concurrently. (Single credit practice teaching may be arranged for individuals not seeking secondary certification.)
Each semester. Staff.

17. Curriculum and Methods Seminar.

This course will consider theoretical and applied issues related to effective classroom instruction. It must be taken concurrently with Educ. 16 for students planning to be certified and may not be taken without taking Educ. 16.
Each semester. Staff.

21. Educational Psychology.

(Also listed as Psychology 21). This course provides a representataive sampling of general psychological theories which have special relevance to sound pedagogical practice. The first part of the course serves as an introduction to theory; the second part considers issues such as: motivation, intelligence, creativity, mainstreaming, etc. Students will also be involved in field research which through use of a multimethod approach addresses topics of concern to local schools.
Fall semester. Staff.

23. Adolescence.

(Also listed as Psychology 23). A developmental perspective is employed to examine salient characteristics of adolescence. The goal is to obtain a theoretical understanding of adolescence and an overview of major research. During the first part of the term, various aspects of individual development (e.g., cognitive, affective, physiological, etc.) will be addressed. The second part of the semester will focus on the adolescent's adaptation in major contexts (e.g., family, peer group, school, etc.).
Spring semester. Smulyan.

25. Counseling: Principles and Practice.

(Also listed as Psychology 22).
An introductory course focusing on theories, techniques, and issues in school and agency counseling. Field work, guest lectures, role playing, and analysis of case studies will provide practical information and experience. Recommended for students considering graduate programs in educational counseling or those planning to teach or do youth work in an agency setting. Enrollment limited.
Not offered 1985-86. Vanni.

31. Women and Education.

This course uses historical, psychological, and social frameworks to examine the roles women take in the educational process. Areas to be explored include the feminization of the teaching profession; equity in educational programs, curriculum, and materials; sex differences in student-teacher interaction and student achievement; and current programs designed to meet the needs of all students and teachers. Students in the course will draw on their own experience as well as field work in relating the theories examined to educational practice.
Spring semester. Smulyan.

47. Education and Society.

(Also listed as Sociology and Anthropology 47). The course will explore the social and cultural

functions and consequences of formal and informal education in both Western and non-Western societies. Modes of intended and unintended socialization within the school and outside will be examined. A range of factors which can promote or inhibit learning will be explored and linked to educational performance. Topics include: school as an agent of social mobility and its relationship with the community; the school as a social system and the dynamics of classroom life; and the behavorial and academic outcomes of curricular innovation. Students will be required to conduct weekly field work in an educational setting.
Not offered 1985-86. Schwartz.

52. Education in America.

(Also listed as History 52). A history of primary, secondary, and higher education in America from the European and colonial orgins to the present. The course will consider both theory and practice within the context of American society and culture, and in relation to other agencies of socialization.
Prerequisite: Introductory level History course.
Not offered 1985-86. Bannister.

64. Political Socialization and Schools.

This course will consider models used to explain the development of political concepts, attitudes, and behavior from the period of early childhood through young adulthood. The interrelated but often inconsistent influences of family, school, peers, media, and critical events in the sociopolitical system will be examined. Special emphasis will be given to the role of education, including formal and informal messages of schooling. Material from nonwestern societies such as China and Nicaragua will provide cross-cultural perspectives on the political socialization process. Field research will be required.
Fall semester. Travers.

66. Child Development and Social Policy.

Issues relating to social policy (e.g., education of the multicultural child, television programming, child care) will be explored in a seminar format. Case studies will be employed to provide a socio-historical context for understanding both ways in which research and policy have interacted in the past and the methodological problems such intersections pose. This course is designed to provide students with a realistic understanding of the process of policy formation and their roles as potential contributors to this process.
Prerequisites: Child Development, Adolescence *or* Educational Psychology.
Spring, 1987. Renninger.

68. Urban Education.

(Also listed as Sociology-Anthropology 68). This course will focus on topics of particular significance to urban educators and policy makers, including desegregation, compensatory education, curricular innovation, community control, bilingual education, and standardized testing. The special problems and challenges faced by urban schools in meeting the needs of individuals and groups in a pluralistic society will be examined using the approaches of psychology, sociology, anthropology, and political science. Current issues will also be viewed in historical perspective. Field work is required.
Not offered 1985-86. Travers.

91. Special Topics.

With the permission of the instructor, qualified students may choose to pursue a topic of special interest, which for thorough investigation will usually require field work as well as research.
Each semester. Staff.

Engineering

CARL BARUS, Professor Emeritus[4]
DAVID L. BOWLER, Professor
H. SEARL DUNN, Professor[2]
NELSON A. MACKEN, Professor and Chairman
M. JOSEPH WILLIS, Professor
ARTHUR E. McGARITY, Associate Professor[3]
FREDERICK L. ORTHLIEB, Associate Professor
FARUQ M. A. SIDDIQUI, Assistant Professor[3]
STEPHEN M. PLATT, Instructor
TERRY L. FRIESZ, Lecturer[4]

The professional practice of engineering requires skill and resourcefulness in applying scientific knowledge and mathematical methods to the solution of technical problems of ever-growing complexity. In addition, the role of engineering in our society demands that the engineer recognize and take into account the economic and social factors that bear upon all important technical problems. The successful engineer must, therefore, possess a thorough understanding of social and economic forces, and have a deep appreciation of the cultural and humanistic traditions of our society. Our program supports these needs by offering the student the opportunity to acquire a broad technical and liberal education. The structure of the Department's curriculum permits engineering majors to take almost forty percent of their course work at the College in the humanities and social sciences. With careful planning it is possible for a student to acquire a double major with two degrees, the Bachelor of Science in Engineering and the Bachelor of Arts in a second academic area in a four-year course of study.

The Department's physical facilities include a wide range of laboratories for general instruction and individual student projects in the areas of electronics, system control, communications, instrumentation, strength of materials, solid and structural mechanics, fluid mechanics, thermodynamics, soil mechanics, and environmental diagnostics. Supporting these laboratories is a wide range of modern measurement equipment with the capability of on-line data acquisition and process control via microcomputers. A computer laboratory with high resolution color and black-and-white graphics capability is also part of our facilities. An excellent shop for both metal- and woodworking is available for student use.

The overall plan leading to the degree of Bachelor of Science with a major in Engineering is accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology.

Courses Available to Non-Majors

Students interested in computer engineering may wish to consider Digital Logic (21), Computer Organization (22), or Laboratory Computer Applications (25). Although Mechanics (6) is primarily for prospective majors, other interested students, particularly those interested in preparing for a career in architecture, are encouraged to enroll. Problems in Technology (3,4) is designed chiefly for students not contemplating further work in engineering or the natural sciences. Operations Research (57), and Environmental Engineering (63) will also appeal to many students majoring in other departments. Students majoring in the physical sciences or mathematics frequently enroll in advanced engineering courses.

2 Absent on leave, spring semester, 1986.
3 Absent on leave, 1985-86.
4 Fall semester, 1985.

Students may minor in the External Examination (Honors) Program in the Engineering Department by taking appropriately related advanced engineering courses as preparation for external examinations. Generally the advanced engineering courses require one or more introductory courses as prerequisites.

Program for Engineering Majors

The general departmental requirements fall into three categories: successful completion of at least (i) twelve engineering courses, (ii) four courses in the sciences including General Physics 3 and 4, to be taken in the freshman year, and (iii) four courses in mathematics, including Math 5 and 6 to be taken in the freshman year and Math 18, normally taken in the sophomore year. The two unspecified science courses in category (ii) and the mathematics course in category (iii) may be chosen to complement the student's overall program of study; in general, the Department recommends Introduction to Chemistry (10) and Linear Algebra (16) or Mathematical Statistics (23) or Differential Equations (30). Certain science and mathematics courses are not acceptable. Students should consult their faculty advisors on this issue.

Within the Department, the following core courses are required of all students: Mechanics, Physical Systems Analysis I and II, Experimentation for Engineering Design, Thermofluid Mechanics, and Engineering Design. The first four courses are normally taken in the freshman and sophomore years: Mechanics in the second semester of the freshman year, Physical Systems Analysis I in the first semester of the sophomore year, and the remaining two in the second semester of the sophomore year. In special circumstances, however, students with adequate preparation in mathematics and physics can begin the engineering curriculum as late as the second semester of the sophomore year and still complete all of the core requirements and elective work in the Department. The course Engineering Design, the culminating experience for engineering majors, is taken in the second semester of the senior year.

In consultation with his or her advisor, each student constructs a program of advanced work in the Department. These programs, normally consisting of six courses, are submitted to the Department when the student formally applies for a major in engineering during the spring semester of the sophomore year.

The program constitutes the student's elected *field of concentration* which may or may not conform closely to the traditional areas of engineering specialization, i.e. civil, electrical, mechanical, etc. For non-traditional plans for advanced work, the Department requires a coherent program that, in its judgment, meets the student's educational objectives.

Observe that the following courses *cannot* be counted in the minimum number of twelve engineering courses required of each major: Problems in Technology I, II, Values and Ethics in Science and Technology, Energy Policy, and Environmental Policy.

Several suggested fields of concentration follow:

(1) General civil engineering: Mechanics of Solids, Structural Theory and Design, Soil and Rock Mechanics, Fluid Mechanics, and Operations Research. Students with a particular interest in environmental topics may replace several of the above courses with Environmental Engineering or Solar Energy Systems.

(2) General electrical engineering: Electronic Circuit Analysis and Design I and II, Electromagnetic Theory, Communication Systems, and Control Theory and Design. Students having an interest in digital systems might replace one or more of these courses with Digital Logic, Computer Organization, or Laboratory Computer Applications.

(3) General mechanical engineering: Mechanics of Solids, Engineering Materials, Fluid Mechanics, Heat Transfer, and Control Theory and Design. Students with a special interest in the field of energy may wish to include Solar Energy Systems or Energy Policy.

(4) Computer engineering and general computer science: Digital Logic, Computer Organization, and Laboratory Computer Applications. Students with an interest in computer hardware may include Electronic Circuit Analysis and Design I and II, or Control Theory and Design. Courses in computer science and/or mathematics can be used to broaden the theoretical foundation of the program.

ENGINEERING

3, 4. Problems in Technology I and II.

Designed primarily for those not planning to major in science or engineering, this course is intended to provide some depth of understanding of technology and its impact by examining in each semester a particular technology. Technical considerations underlying policy issues will be stressed. Examples of semester topics are: aspects of the energy problem, satellite communications, managing environmental hazards, and developments in data processing. A strong background in high school mathematics is assumed. Includes laboratory. Credit may be given for either semester, or both.

6. Mechanics.

Fundamental areas of statics and dynamics. Elementary concepts of deformable bodies including stress-strain relations, beam, torsion, and stress transformations. Laboratory work is related to experiments on deformable bodies, and includes a four-week FORTRAN 77 workshop.

Prerequisite: Physics 3 or equivalent.

Spring semester.

11, 12. Physical Systems Analysis I and II.

These courses are devoted to the study of physical phenomena which may be represented to a good degree of approximation by a linear, lumped-parameter model. E11 (fall semester) is oriented mainly toward electrical devices and the development of mathematical techniques for the analysis of their linear behavior. E12 (spring semester) is more concerned with mechanical, thermal, and fluid systems, but emphasis throughout both courses will be placed upon the unity resulting from the common mathematical representation and analysis of diverse physical systems. The content of E11 is: Behavior of electrical circuits; natural and forced transient response, steady-state harmonic excitation. Modeling of active devices, operational amplifiers, and their use in circuit design. Introduction to the Fourier series and Laplace transform. Pole-zero concepts, notions of stability, and energy considerations. E12 will be devoted to: multi-degree of freedom mechanical, electromechanical, thermal and fluid systems. Transfer function and matrix descriptions of compound systems, the eigenvalue problem and state space techniques. Mechanical systems in two and three dimensions, energy methods, coupled modes of motion. Transition from many degree of freedom systems to continuous systems; the Fourier integral with applications to wave motion.

Laboratory sessions include introduction to numerical and graphical methods of dynamic system analysis through the use of microcomputers, spreadsheet software, and graphics workstations.

Credit may be given for either semester, or both.

14. Experimentation for Engineering Design.

Theories of experimentation and measurement are presented and are related to engineering design and research projects. Lectures present probability theory and its applications in experimentation. Topics include random variables, probability distributions, measurement errors, random noise, system reliability, statistical analysis of experiments and simulated experiments, and decision making with experimental results. The laboratory section treats the analysis of measurement systems and involves the experimental determination of measurement system parameters.

Prerequisites: E11 and E12 (taken concurrently)

Spring semester.

21. Digital Logic.

An introduction to the theory and design of digital logic circuits. Following a discussion of number systems and Boolean algebra, minimization and realization techniques are studied for combinational systems. The latter part of the course will be concerned with the treatment of sequential systems. Switching devices will be characterized only as to their terminal behavior and no consideration will be given to the physical basis for their operation. The course is intended for students with a good background in basic mathematics through algebra. Includes laboratory.

Fall semester. Not open to freshmen.

22. Computer Organization.

A study of the ways in which the functional units of a typical digital computer may be interconnected. Hardware implementation of

registers, counters, adders and the functional units themselves. Micro-programmed control. Characteristics of the several types of memory. Includes laboratory.
Prerequisite: E21.
Spring semester.

25. Laboratory Computer Applications.

The study and selection of microprocessor architecture, hardware modules, and interfaces for use in laboratory instrumentation. The laboratory exercises are designed for the development of a working microprocessor-based system.
Prerequisite: Permission of instructor. Intended for engineering and science majors.
Fall semester.

27. Numerical Methods.

(Also listed as Mathematics 67). This course will deal with the numerical solution of various mathematical problems, pure and applied. The computer will be used extensively.
Prerequisite: Math 6 and E23 or equivalent.
Fall semester.

34. Values and Ethics in Science and Technology

(Also listed as Philosophy 34). The course deals with topics such as the following: historical and current attitudes toward technology; the nature of ethics; origins and impact of professional ethics (chiefly in the engineering professions); ethical dilemmas faced by engineers and scientists; values in the technological society; forecasting and assessment of technological growth; how policy decisions about technology are made; the role of personal ethics of the engineer or scientist.
Open to all who have completed the science distribution requirement.
Spring semester.

35. Solar Energy Systems.

Fundamental principles in the analysis and design of systems which collect, store, and use the direct and indirect forms of solar energy. Examples of current solar technology are used as illustrations. Stochastic and deterministic mathematical models are used to describe the performance of components and systems. Cost functions are developed for use in economic assessments. Techniques for system optimization are discussed.
Prerequisites: Mathematics 5, 6; Physics 3, 4.
Fall semester, alternate years. Not offered 1985-86.

41. Thermofluid Mechanics.

Introduction to macroscopic thermodynamics; first and second laws, properties of pure substances, thermodynamics of an ideal gas, applications using system and control volume formulation. Introduction to fluid mechanics; development of conservation theorems, hydrostatics, dynamics of one-dimensional fluid motion. Includes laboratory.
Prerequisites: E12 and E14 (or equivalent background).
Fall semester.

57. Operations Research.

(Also listed as Economics 57). The principal mathematical tools for optimal decision making are presented and applied through case studies from the private and public sectors. Topics include assignment and transportation problems, linear and dynamic programming, decision making under uncertainty, game theory, stochastic processes, and queuing theory. Also, the working principles of engineering economy are introduced and combined with operations research topics. This course may precede or follow Mathematics 28 (Mathematical Programming) for a strong introduction to the theory and practice of optimization. Normally for sophomore and junior students.
Fall semester.

58. Control Theory and Design.

An introduction to the control of engineering systems. Analysis and design of linear control systems using root locus and frequency response techniques. Over-driven operation of first- and second-order controlled systems. Digital control techniques, including analysis of A/D and D/A converters, digital filters, and numerical control algorithms. Laboratory includes design of both analog and digital controllers.
Prerequisite: E12 or equivalent.
Spring semester.

59. Mechanics of Solids.

This course deals with the internal stresses and changes of form when forces act on solid bodies. State of stress and strain, strength theories, stability, deflections, and photoelasticity. Elastic and Plastic theories. Includes laboratory.
Prerequisite: E6 or equivalent.
Fall semester.

60. Structural Theory and Design I.

An introduction to the fundamental principles of structural mechanics. Statically determinate analysis of frame and trusses. Approximate analysis of indeterminate structures. Virtual work principles. Elements of design of steel and concrete structural members.
Prerequisite: E59.
Spring semester.

61. Soil and Rock Mechanics: Theory and Design.

Principles of soil and rock mechanics. Subjects include soil and rock formation, soil mineralogy, soil types, compaction, soil hydraulics, consolidation, stresses in soil masses, slope stability, and bearing capacity. These topics are applied to engineering design problems. Includes laboratory.
Prerequisite: E59 or equivalent.
Fall semester.

62. Structural Theory and Design II.

Advanced structural analysis. Classical and matrix methods of analysis. Digital computer applications. Design of steel and concrete structures.
Prerequisite: E60.
Fall semester; alternate years.

63. Environmental Engineering.

An introduction to the elements of water quality managment. Effects of human activities on water quality and quantity. Environmental impact assessment. Analysis and treatment of natural and wastewaters. Introduction to water quality models. Laboratory and field studies of local water quality problems.
Prerequisite: Two semesters of science or engineering.
Fall semester.

64. Water Resources.

An introduction to the fundamentals of water resources engineering. Pertinent areas of hydrology, hydraulics, and systems analysis are included. Fundamentals are related to engineering aspects of planning and designing water resources projects. Includes laboratory.
Prerequisite: E12; E83 recommended.
Spring semester.

66. Energy Policy.

(Also listed as Political Science 66). Presentation and exploration, in seminar format, of political, economic, and technological issues affecting development of energy policy, and investigation of the influence of energy policy on policymaking in other areas. Possible topics include: development of the U.S. energy bureaucracy, international political/economic decision-making and OPEC, development and impact of energy price decontrol, economic and political aspects of U.S. energy technology exports, economic and environmental perspectives of energy resource development (renewable and otherwise). Enrollment by permission of instructors. Suggested preparation includes Economics 1-2 and Political Science 2 or 51.
Fall semester. Not offered 1985-86. (Does not satisfy distribution requirement.)

68. Environmental Policy.

(Also listed as Political Science 68.) Issues in environmental policy formulation and implementation are explored. Both of these aspects require an understanding of environmental processes, including natural and technological processes. Trade-offs between environmental and economic objectives are examined using quantitative policy models. Enrollment is by consent of instructor. Operations Research and/or Statistics are recommended as prerequisites.
Spring semester. Not offered 1985-86. (Does not satisfy distribution requirement.)

71. Circuits and Systems.

Analysis and synthesis of electric circuits and other dynamic systems. Properties of linear system functions and their application to system design, active systems and stability, response to random signals, energy functions and theorems, digital filters, state variable analysis of linear and non-linear systems, optimization. Application of theory to engineering design. Includes laboratory.
Prerequisite: E12 or equivalent.
Fall semester. Offered when demand and staffing permit.

73, 74. Electronic Circuit Analysis and Design I and II.

This course begins with an introduction to the physics of semiconductor devices and modern device technology. The remainder of the year is devoted to the study of analog and digital circuits and includes an introduction to digital logic design. Circuits employing both bipolar and field effect devices are considered. Use of the circuit simulation program SPICE is empha-

sized. Laboratory work is oriented toward design problems.
Prerequisite: E12 or equivalent. E73 is a prerequisite for E74.

75. Electromagnetic Theory.

Engineering applications of Maxwell's equations. Macroscopic field treatment of magnetic, dielectric and conducting materials. Forces, motion, and energy storage. Field basis of circuit theory. Electromagnetic waves; waveguides, transmission lines, and antennas. Includes laboratory.
Prerequisite: E12 or equivalent; Mathematics 18.
Fall semester.

78. Communication Systems.

Theory and design principles of analog and digital electronic communications. Such topics as information theory, coding, analog and digital modulation, multiplexing, noise, filtering, and data transmission will be treated. Emphasis will be placed on theoretical and practical limitations and functional design. Application will be made to a variety of practical systems such as television relay, facsimile, telemetry, broadcasting, and data communications. Includes laboratory.
Prerequisite: E12 or equivalent.
Spring semester, alternate years. Not offered 1985-86.

81. Thermal Energy Conversion.

Development and application of the principles of thermal energy analysis to energy conversion systems. Brief examination of world energy supplies. Review of the principles of the first and second laws of thermodynamics. Development of the concepts of availability, reacting and non-reacting mixtures, chemical and nuclear reactions. Applications investigated include: Rankine cycles, gas turbines, internal combustion engines, heat pumps, and solar energy systems. Includes laboratory.
Prerequisite: E41.
Spring semester; alternate years. Not offered 1986-87.

82. Engineering Materials.

Study of the physical structure and properties of a wide variety of engineering materials, and the processes by which they are transformed into useful products. The course includes analysis of material microstructures, macroscopic physical properties, and in-service performance with regard to mechanical, thermal, electrical, and chemical factors. Metals, plastics, concrete, wood, fiber-reinforced and structural composites are considered, both with regard to industrial processing and property modification and to materials selection in engineering design. Laboratory work includes exercises in property testing and material selection, field trips to materials-processing plants, and a substantial individual project.
Prerequisite: E59 (may be taken concurrently) or permission of instructor.
Fall semester; alternate years. Not offered 1986-87.

83. Fluid Mechanics.

Fluid mechanics is treated as a special case of continuum mechanics in the analysis of fluid flow systems. Relevant equations for the conservation of mass, momentum, and energy are derived. These are then applied to the study of flows of inviscid and viscous, incompressible and compressible fluids. Includes laboratory.
Prerequisites: E41 or equivalent.
Spring semester; alternate years. Not offered 1985-86.

84. Heat Transfer.

A basic introduction to the physical phenomena involved in heat transfer. Analytical techniques are presented together with empirical results to develop tools for solving problems in heat transfer by conduction, forced and free convection, boiling, condensation, and radiation. Numerical techniques are discussed for the solution of conduction problems. Includes laboratory.
Prerequisites: E41 or equivalent.
Fall semester; alternate years. Not offered 1986-87.

90. Engineering Design.

This project-oriented course serves as a culminating exercise for all Engineering majors. Under the guidance of a faculty member, students investigate a problem of their choice in an area of interest to them. In some cases, group projects are possible. At the end of the semester students prepare a written report and make an oral presentation.
Spring semester.

91. Special Topics.

Subject matter dependent on a group need or individual interest. Normally restricted to senior students and offered only when staff interests and availability make it practicable to do so.

93. Directed Reading or Project.
With the permission of the Department and a faculty member who is willing to supervise it, qualified students may do special work with either theoretical, experimental, or design emphasis in areas not covered by the regular courses.

96. Thesis.
With approval, a student may undertake a thesis project as a part of his or her program in the senior year. The student is expected to submit a prospectus of the thesis problem before the start of the semester in which the thesis project is carried out.

PREPARATION FOR EXTERNAL EXAMINATIONS

The Department will arrange External Examinations in the following areas to be prepared for by the combinations of courses indicated.

Electronics
Electronic Circuit Analysis and Design I and II

Digital Systems
Digital Logic
Computer Organization, or Laboratory Computer Applications

Systems and Control
Circuits and Systems
Control Theory and Design

Communications
Electromagnetic Theory
Communication Systems

Energy Conversion
Heat Transfer
Thermal Energy Conversion

Water Resources Engineering
Environmental Engineering
Water Resources

Structural Mechanics
Mechanics of Solids
Structural Theory and Design

Mechanics of Materials
Mechanics of Solids
Engineering Materials

English Literature

THOMAS H. BLACKBURN, Professor[2]
KAZIMIERZ BRAUN, Visiting Professor of Theatre
DENNIS BRUTUS, Cornell Visiting Professor
LEE DEVIN, Professor and Director of The Theatre[3]
CHARLES L. JAMES, Professor
HAROLD E. PAGLIARO, Professor
SUSAN SNYDER, Professor and Chair
PHILIP M. WEINSTEIN, Professor
MARY L. POOVEY, Associate Professor
CRAIG WILLIAMSON, Associate Professor
NATHALIE F. ANDERSON, Assistant Professor[3]
LAURIE LANGBAUER, Visiting Assistant Professor
THOMAS P. LEFF, Assistant Professor and Technical Director of The Theatre
PETER J. SCHMIDT, Assistant Professor
ABBE BLUM, Instructor
ELIZABETH CHADWICK, Lecturer
MARCEL L. CHERRY, Lecturer

This Department offers courses in English literature, American literature, theatre, some foreign literatures in translation, and critical theory. The departmental curriculum is planned to provide experience in several critical approaches to literature and play production, in the intensive study of works of major writers, the study of the development of literary types, and the theoretical considerations implicit in literary study. The Department also provides some instruction in the writing of poetry, fiction, and drama, in acting, and in design for the theatre.

REQUIREMENTS AND RECOMMENDATIONS

Any introductory course—English 2 through 15—is the prerequisite for all other courses in literature. (This prerequisite does not apply to seniors, nor is it required of those who wish only to take studio courses.) Introductory courses are characterized by syllabi with less reading than in advanced courses, by frequent short papers, and by considerable attention to class discussion; they are viewed by the Department as particularly appropriate for freshmen. Enrollment will be limited to 25 students per course; priority is given to freshmen and sophomores. Students will not normally take a second introductory course unless approved by the instructor of the first course. Only one such course may be counted towards the major. The minimum requirement for admission as a major or as a minor in English is two semester-courses in the Department. (Students with AP scores of 4-5 in English Literature and/or English Composition receive credit toward graduation. This credit, when it is for work in English Literature, may count as well toward distribution and major requirements.)

Students considering a major in English are strongly urged to take one or two additional courses during the sophomore year. Majors and prospective majors should consult a member of the English Department for information about courses in other departments complementary to their work in English; work in foreign languages is especially recommended.

2 Absent on leave, spring semester, 1986.
3 Absent on leave, 1985-86.

Students who plan to do graduate work, to follow a course of professional training, or to seek teacher certification in English, should see a member of the Department for early help in planning their programs, as should students who plan to include work in English literature in a program with a major in Literature or Medieval Studies. Students planning to qualify for teacher certification in English are reminded that work in American literature and in linguistics or the history of the English language is required in addition to other requirements of the major.

Major in the Course Program: The work of a major in Course consists of a minimum of eight semester courses in the Department, including Shakespeare, at least two courses in literature written before 1830 (such courses are marked with a *), and one course featuring critical theory (such courses are marked with a **). The Comprehensive Examination, taken at the beginning of the spring semester of the senior year, will be based on a list of major authors. This list will be available to majors and prospective majors at least three semesters before the date of the exam itself.

Major in the External Examination (Honors) Program: Majors in the Honors Program must prepare three or four papers in the Department, two of which must be on subjects covered in seminars in Group 1 or on other early material decided upon after consultation with the Department. Majors must also take a course or seminar that features critical theory (such courses and seminars are marked with a **).

Minor in the External Examination (Honors) Program: Minors are ordinarily required to prepare two papers in the Department.

Theatre Concentration: The work of a major in Course with a concentration in Theatre consists of a minimum of eight semester courses, including the following required courses: Introduction to Theatre (Theatre 1), Introduction to Design (Theatre 14), Theatre History (Theatre 13), and Shakespeare. In addition, majors are required to take at least one other course in dramatic literature written before the modern period. The Comprehensive Examination (taken at the beginning of the spring semester of the senior year) will be in two parts: 1) a three-hour exam based on a reading list of plays and critical works given to students when they are accepted into the major; and 2) a take-home essay describing solutions to artistic and critical problems. A Senior Essay or project (Theatre 29, 30) is optional; interested students should consult with the appropriate advisor in the spring of their junior year.

Students are urged to consult the announcements of other departments which offer courses appropriate to the concentration. It is useful for those anticipating a theatre concentration to plan their programs early to avoid possible conflict with the twenty-course rule.

1A. Expository Writing (Workshop).

Individual and group work as intensive preparation for further work and with applications to a variety of fields. For students to whom the course is recommended. Does not meet the distribution requirements. May be taken in more than one semester, but for a maximum of one and one half credits.
Each semester. Cherry.

1B. English for Foreign Students.

Individual and group work on an advanced level for students with non-English backgrounds. Does not meet distribution requirements.
Each semester.

1C. The Writing Process.

This course combines study of theories of composition and the teaching of writing with supervised experience applying the skills derived from that study in paper comments and conferences. Enrollment limited to students selected as Writing Associates.
Fall semester. Blackburn.

2. Science and the Literary Imagination.

An introduction to the critical reading of literature, using texts (in prose and verse from the 16th century to the present) which are concerned with or reflect the impact of science and scientific thinking on individual and society.
Not offered 1985-86. Blackburn.

3. Studies in the Construction of Character.

This course will examine different constructions of character in poems, plays, stories, novels, and essays, with particular attention to the ways writing writes us. We will consider

issues of cultural stereotypes and of gender, and extend our investigation to painting as well. Readings from the Renaissance through today. Writers will include, among others, Burton, Jonson, Pope, Hardy, Freud, Woolf, Forster, Stein, as well as contemporary poets and fiction writers.
Each semester. Langbauer.

4. The Outsider.

Alienation as stance and theme in drama, narrative, and lyric poetry: close study of works by Shakespeare, Milton, Marvell, Conrad, Charlotte Bronte, T. S. Eliot, and Margaret Atwood.
Not offered 1985-86. Snyder.

5. Coming of Age.

This course will deal with various treatments of growing up in plays, lyrics, and novels from ancient Greece to contemporary America. Writers to be studied include Sophocles, Shakespeare, Dickens, Morrison and several contemporary poets.
Not offered 1985-86. Poovey.

6. Rites of Passage.

The course will focus on various rites of passage, symbolic actions which chart crucial changes in the human psyche, as they are consciously depicted or unconsciously reflected in different literary modes, and will examine the shared literary experience itself as ritual process. Topics will include innocence and experience, transition and stasis, community and liminality, and the mediation of the sacred and the profane. Major authors will include Blake, Shakespeare, Conrad, and Lawrence.
Fall semester. Williamson.

7. Comedy.

A study of the form and function of comedy in works by Shakespeare, Austen, Gogol, Welty, Ellison, Beckett, and selected poets.
Each semester. Schmidt.

8. The Ironic Spirit.

This course focuses on the way the ironic mode—both verbal and philosophical—accommodates responses to fundamental contradictions and paradoxes. Authors include Shakespeare, Fielding, Hardy, Emily Dickinson, Twain, Stephen Crane, and Ralph Ellison.
Fall semester. James.

9. Four Secular Writers of the Spirit.

A study of iconoclastic authors—Blake, George Eliot, Shaw, and Lawrence—whose works attack orthodox ways and offer moral alternatives as necessary to human well-being.
Fall semester. Pagliaro.

10. Ways of Seeing.

Perspectives of writers and readers in a variety of literary contexts. This course will examine point of view, frames of reference, modes of perception: how authors "tell all the truth but tell it slant." We will consider how cultural beliefs are propagated and changed by visual and verbal devices. Works by Shakespeare, Herbert, Le Guin, Bierce, Dickinson, Browning, Ellison, Woolf, Pinter.
Fall semester. Blum.

11. Figures in the Veil.

A study of the phenomenon of double-consciousness in selected narratives and poetry written by Afro-Americans since the Civil War. Authors will include Chesnutt, W.E.B. DuBois, Ellison, Hughes, Zora Hurston, J.W. Johnson, and selected poets.
Not offered 1985-86. James.

12. The Picaresque.

This course will consider the western development of a resilient theme in literature: adventures of a rogue or scoundrel. The class will identify structural and thematic concerns typical of the literature of roguery and discuss the theoretical problems involved in the definition of literary genre. Readings will be in English but will be drawn from more than one linguistic tradition. Emphasis will be on class discussion and on the writing of five critical papers. Readings drawn from such authors as Defoe, Smollett, Fielding, Byron, Lesage, Twain, Mann, Bellow, Kerouac, Graff and others.
Fall semester. Chadwick.

13. Studies in Literature of the Fantastic.

Working from a foundation in the psychological theories of Freud and Jung, this course examines a variety of works which posit an alternative reality, confront characters and readers with psychological darkness, or otherwise explore the possibilities of fantasy. Among texts we will consider are *Sir Gawain and the Green Knight*, Shakespeare's *The Tempest*, Mary Shelley's *Frankenstein*, poems of W.B. Yeats, and Marquez' *One Hundred Years of Solitude.*
Not offered 1985-86. N. Anderson.

14. Contemporary African Literature.
This course will introduce the student to contemporary African writing in various genres including drama, fiction, and poetry. Among the writers studied will be Achebe, Beti, LaGuma, Ngugi, Sembene, and Soyinka. Some supplementary critical reading will be required.
Spring semester. Brutus.

16. Survey of English Literature, I.*
An historical and critical survey of poetry, prose, and drama from *Beowulf* to Milton.
Fall semester. Pagliaro.

17. Survey of English Literature, II.
An historical and critical survey of poetry, prose, and drama from Dryden to Lawrence.
Spring semester. Pagliaro.

20. Introduction to Old English: Language, Literature, and Culture.*
The course will be an introduction to Old English language, literature, and culture with an emphasis upon elegiac and heroic poetry. Initially, two days a week will be devoted to learning the language and to reading selected prose passages. One day a week will be spent on a cultural topic such as history, art, architecture, religion, or Germanic traditions. The latter part of the course will be devoted entirely to the study of Old English poetry. With the permission of the instructor this course may be taken without the usual prerequisite course; however, it may not serve in the place of a prerequisite for other advanced courses.
Fall semester. Williamson.

21. Chaucer.*
Reading in Middle English of most of Chaucer's major poetry with emphasis on *The Canterbury Tales* and *Troilus and Criseyde*. The course attempts to place the poetry in a variety of critical and cultural contexts—both medieval and modern—which help to illuminate Chaucer's art.
Spring semester. Williamson.

22. Medieval English Literature.*
The course is a survey of English literature, primarily poetry, from the 8th through the 15th century. Readings will include: Old English riddles, elegies, and charms, *Beowulf*, several of Chaucer's *Canterbury Tales* and *Troilus and Criseyde*, selected mystery plays, *Everyman*, *Sir Gawain and the Green Knight*, *Pearl*, portions of *Piers Plowman*, and Malory's *LeMorte d'Arthur*. Selected lyrics and *Canterbury Tales* will be read in Middle English; other works in translation or modernized forms. No previous knowledge of Middle English is required.
Not offered 1985-86. Williamson.

25. Shakespeare.*
Two traditionally separate approaches to Shakespearean drama, the literary and the performative, converge in this course. Thus Shakespeare's plays are approached both as literature and as blueprints for performance that lead to the study of acting, scenic design, directing and the history of the drama in performance. In addition to discussions and lectures the course includes both professional and amateur performances of scenes, and film and video showings.
Fall semester. Blum and Leff.

26. Renaissance Poetry.*
Lyric and narrative poetry of the Elizabethan age and early 17th century.
Not offered 1985-86. Snyder.

27. Tudor-Stuart Drama.*
Development of the English drama in the sixteenth and seventeenth centuries.
Not offered 1985-86. Blackburn.

28. Milton.*
Study of Milton's poetry with particular emphasis on *Paradise Lost*.
Not offered 1985-86. Blackburn.

35. Eighteenth-Century Literature.*
A study of selected English prose and poetry from 1660-1800, with some special attention given to works that attempt to find order and stability in the face of social, religious, and emotional doubt. Authors to be read include Dryden, Swift, Pope, and Johnson. Aspects of Hobbes, Natural Supernaturalists, Graveyard poets, and others will also be considered, chiefly as background.
Not offered 1985-86. Pagliaro.

36. English Novel, I.*
How does the novel define itself? We will consider the novel's unceasing and always incomplete process of self-definition, especially in terms of its relation to other forms of prose fiction. We will also read some standard critical writings critically. Writers will include Sydney, Richardson, Fielding, Sterne, Austen, Brontë,

Dickens.
Fall semester. Langbauer.

38. Romantic Poetry.*

A study of the poetry of Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats, with attention given to the ideas as well as to the form and structure of their works.
Spring semester. Pagliaro.

41. Eminence and Decadence: The Victorian Poets.

A study of the poetry of Tennyson, Robert and Elizabeth Barrett Browning, Arnold, Meredith, the Rossettis, Wilde, and others, with particular attention to each artist's response to the stresses of the era.
Not offered 1985-86. N. Anderson.

42. English Novel, II.

A consideration of English fiction since 1850.
Not offered 1985-86.

43. Studies in English Fiction.

This course will study developments in fiction (mainly English) from Dickens, George Eliot, and Flaubert to Lawrence and Joyce. Syllabi vary from year to year, but the focus remains on ideological premises and aesthetic practices as these alter in the transition from Victorian to Modern culture.
Fall semester. Weinstein.

44. Narrative Contracts: Readings in the Novel.

The texts and thematic focus of this course will vary from year to year, but attention will always be given to the following topics: the relationship between formal and thematic elements of novels, narrative contracts with the reader, the representation of gender, and women writers.
Not offered 1984-85. Poovey.

45. Modern British Poetry.

A consideration of the major British poets from Hardy to Ted Hughes, with particular attention given to each poet's individual response to the circumstances of modern life.
Not offered 1985-86. N. Anderson.

46. Introduction to Anglo-Irish Literature.

This course will cover the background to the modern literature through such topics as epic literature, the monasteries, the Big House, the Irish storyteller, and will include readings from The Tain and the Finn Cycle, as well as from Somerville and Ross, Synge, O'Casey, Kavanagh, Heaney, and others.
Spring semester. Durkan.

50. Studies in the American Renaissance.**

A study of the central writers of the American Renaissance, 1820-1865: Emerson, Hawthorne, Margaret Fuller, Thoreau, Melville, Walt Whitman, and Emily Dickinson.
Not offered 1985-86. Schmidt.

51. Fictions of American Naturalism.

This course examines several important attempts by American writers of fiction to redefine the tragic experience in modern terms and consistent with the way scientific method, deistic faith, and biological discoveries converged in their imaginations. Writers will include Kate Chopin, Stephen Crane, Theodore Dreiser, W. D. Howells, Jack London, Frank Norris, and Richard Wright.
Spring semester. James.

52. Twain, Faulkner, Richard Wright, and Flannery O'Connor.

Selected works, with emphasis on Faulkner. The course will focus on the ways in which the writer's imagination confronts some of the ideals and contradictions of American life (with special attention to relations between blacks and whites).
Not offered 1985-86. Weinstein.

53. Topics in American Literature.

A survey of several enduring issues in American literature, among them the myth of the self-made man or woman, the "plain style" in prose and poetry, and the concept of manifest destiny in Puritan, Deist, and Romantic historiography. The reading will include a variety of texts, from autobiographies, histories, essays, diaries, and political tracts, to poems and fiction. Authors to be studied include the Puritans Bradstreet, Winthrop, Taylor, and Edwards; the Deists Franklin, Jefferson, and Paine; and Douglass, Hawthorne, Emerson, Thoreau, Whitman, Dickinson, Twain, Chopin, and Fitzgerald.
Not offered 1985-86. Schmidt.

54. Studies in American Fiction.

An introduction to the development of the American short story from the early nineteenth century to the present, including work by Irving, Poe, Hawthorne, Melville, Wilkins, Freeman, Hemingway, Fitzgerald, O'Connor,

Welty, Barthelme, and Pynchon.
Not offered 1985-86. Schmidt.

55. Modern American Poetry.
Selected poems and prose by Williams, H. D. Pound, Stevens, Moore, and others.
Fall semester. Schmidt.

56. Contemporary Poetry.
Not offered 1985-86. N. Anderson.

57. Contemporary American Prose.
An examination of the myriad regional accents, aims, and styles—from documentary realism to symbolic fantasy—which distinguish American prose since World War II.
Spring semester. Schmidt.

58. The American Autobiography.
This course examines—through the genre of autobiography—the American tendency to discover, assert, and recreate the Self. The range of authors is meant to suggest possible pairings of interrelated black and white works and includes Benjamin Franklin, Frederick Douglass, Henry Adams, Jane Addams, Gertrude Stein, Richard Wright, Zora Hurston, Norman Mailer, Maya Angelou, and Malcolm X.
Fall semester. James.

59. The Black American Writer.
This survey of prose fiction and poetry pays particular attention to the way the Afro-American author engages the modes of the pastoral and "antipastoral" as thesis and antitheses. Writers include Charles Chesnutt, Jean Toomer, Zora Hurston, Sterling Brown, Richard Wright, Gwendolyn Brooks, and James Baldwin.
Not offered 1985-86. James.

60. The Contemporary Black Writer of the United States.
An examination of the way history, myth, and blues (as oral form) are transformed into metaphor, ritual, and motif by contemporary Afro-Americans. Writers discussed will include Baldwin, Baraka, David Bradley, Morrison, Alice Walker, and selected poets.
Not offered 1985-86. James.

65. Poetry Workshop.
A class, limited to twelve, in which students write, read, translate, and talk about poetry. We will emphasize the discovery and development of each individual's distinctive poetic voice, imagistic motifs, and thematic concerns, within the context of contempory poetics. Students should submit 3-5 pages of poetry for admission, at a time announced during fall semester. The workshop will meet once a week for three hours. Admission and credit are granted at the discretion of the instructor. (Studio course)
Spring semester. Schmidt.

66. Fiction Writers' Workshop.
The course is devoted to the analysis of stories submitted by students. It meets once a week for three hours. In addition to receiving practical help from fellow writers, students have an opportunity to articulate and explore theoretical aspects of fiction writing. Students should submit one story for admission, at a time announced during the fall semester. Admission and credit are granted at the discretion of the instructor. (Studio course)
Spring semester.

67. Colloquium: Readings in Butler and Shaw.
A selection of novels, essays, and plays by Samuel Butler and George Bernard Shaw. Discussions and papers will focus on the view of human relationships and social structures in each author, as well as the literary techniques each uses to present and evaluate them. Butler's and Shaw's opposition to Darwinian evolution will also be considered briefly.
Spring semester. Pagliaro.

68. Reading and Writing Poetry.
This course aims at developing the ability both to read and write poetry. A considerable portion of our time will be devoted to the study of traditional verse forms. In addition members of the class will be required to do original work, some of which will be brought into class for discussion and revision.
Fall semester. Brutus.

69. Colloquium: Advanced Shakespeare.
Desire, death, and domestication of love in Shakespeare's middle and late plays. Intensive study of *Measure for Measure, Othello, The Winter's Tale, King Lear, Pericles, Coriolanus, Antony and Cleopatra, The Tempest*, with special attention to genre study.
Spring semester. Blum.

70. Renaissance Comparative Literature.*
(See CEL 70.) Humanism and "Counter-Ren-

aissance" developments in major writings of Renaissance Europe: Erasmus, More, Rabelais, Petrarch, Gaspara Stampa, Ariosto, Marguerite de Navarre, St. John of the Cross, and Cervantes (all studied in translation).
Not offered 1985-86. Snyder.

71. European Romanticism.*

(See CEL 71.) The class will elaborate a definition of literary romanticism in a European context. We will consider popular forms such as ballads and folk tales, as well as hymns, poems, gothic and epistolary novels, and drama. Discussion of such themes as Orientalism, medievalism, the supernatural and the scientific. Authors include: Shakespeare, Wordsworth and Coleridge, Shelley, E.T.A. Hoffman, Goethe, Novalis, Chateaubriand, Beckford, Constant, Foscolo. All texts available in translation; students with working knowledge of French and German are encouraged to read in the original language.
Not offered 1985-86. Chadwick.

72. Proust, Joyce, and Faulkner.

Selections from Proust's *Remembrance of Things Past*, Joyce's *Portrait of the Artist* and *Ulysses* entire, and selected Faulkner novels. Emphasis on the ideological and formal tenets of modernism.
Not offered 1985-86. Weinstein.

73. Proust and Joyce.

An intensive comparative study. Readings will include *A Portrait of the Artist as a Young Man*, *Ulysses*, and substantial portions of *A la Recherche du temps perdu*. Proust readings and lectures will be conducted in French. Crosslisted as French 75, this course counts toward concentration in either English or French. It will explore the role of the artist; the modernist sense of character; narrative experiments with plot, style, and point of view; the meanings of time and memory.
Prerequisites: French 12 and an introductory English course (or their equivalents).
Not offered 1985-86. Weinstein and Roza.

74a. Modern Drama I: Ibsen to Avant Garde.

A study of the major dramatists from the turn of the century to the rise of the avant garde. Playwrights will include Ibsen, Chekhov, Strindberg, Shaw, Pirandello, Brecht, O'Neill, Genet, Beckett, and Pinter. Theoretical readings will include Stanislavsky, Nietzsche, Freud, Brecht, and Artaud. There will be occasional labs for working on scenes with professional actors and for viewing film versions of the plays. (Crosslisted CEL 74a.)
Spring semester. Williamson.

74b. Modern Drama II: Avant Garde and Contemporary.

A study of a broad range of recent dramatic writing. Particular emphasis on experimental and radical theatre movements in England, Germany, Poland, and the United States. Authors include: Beckett, Bond, Stoppard, Handke. Kroetz, Witkiewicz, Rozewicz, Shepard, and Foreman. (Crosslisted CEL 74b).
Not offered 1985-86. Leff.

75. Modern Poetry.

A consideration of the various manifestations of modernism in English Language poetry on either side of the Atlantic. We will trace the careers of the High Modernists Yeats, Lawrence, Pound, and Eliot; weigh the American experiments of Stein, Stevens, Williams, and Marianne Moore; review the impact of Imagism and the Harlem Literary Renaissance; examine brief and extended poetic responses to some of the radical uncertainties engendered by early twentieth-century history.
Not offered 1985-86. N. Anderson.

76. The Black African Writer.

This study gives particular attention to the way black African writers portray Africa emerging from the age of myth—where the conceptualization of time shaped and was shaped by a traditional way of life—into a conception of time as we know it in our industrialized culture. Readings will be chosen from works written in English and in translation, including Achebe, Armah, Ngugi, Sembene, Senghor, and Soyinka.
Not offered 1985-86. James.

77. Freedom and the African Writer.

The history of modern Africa is filled with coups, countercoups, and reports of denials of human rights. For writers censorship, bannings, and banishments have become a common experience. This course will study a number of novels by contemporary Africans in order to examine their treatment of these issues and to arrive at an understanding of these problems. Novels read will include works by Achebe,

Armah, Beti, LaGuma, Ngugi, and Sembene.
Fall semester. Brutus.

78. The African Novel.

A consideration of the major African novelists, with attention to both the political and aesthetic dimensions of their work.
Spring semester. Brutus.

79. Studies in Comparative Fiction.

This course will explore the relationship between desire and the law, as well as the social construction of identity, in a range of 19th- and 20th-century novels. Writers will include Dickens, Dostoevsky, Flaubert, Tolstoy, Kafka, and Faulkner. (Crosslisted as CEL 79.)
Spring semester. Weinstein.

80. Satire.

This examination of satire as a literary genre focuses on satiric forms and objectives. Emphasis is placed on distinguishing between two main conceptions of satire and, therefore, two different types of satirists. Selections are chosen from Horace and Juvenal, Petronius, Shakespeare, Pope, Swift, Voltaire, Twain, Huxley, and Ishmael Reed.
Spring semester. James.

82. Representations of Women's Identity.**

(Cross-listed as Psychology 52.) A study of the ways in which psychology, literature, and literary theory illuminate women's identity and self-expression. By examining such material as psychological case studies, fairy tales, poetry and fiction by male and female authors, psychological theory and literary criticism, we will identify some of the ways in which women have been represented in our culture, the consequences of this representation, and possibilities for expanding self-awareness and creativity.
Prerequisite: an introductory course in English.
Not offered 1985-86. Poovey and Marecek.

84. Folklore and Folklife Studies.

(See History 84.)
Spring semester. Morgan.

85. Modernism in American Art and Literature, 1870-1930.

An interdisciplinary study of the origins, ideology, and development of modernism and anti-modernism in American culture between 1870 and 1930 using approaches from the fields of art history, American studies, and literary criticism. Artists considered include Eakins, Homer, Cassatt, the Achcan school, the '291' group, Hopper, and Wood; writers include James, Wilkins, Freeman, Crane, Fitzgerald, William Carlos Williams, and Nathaniel West.
Prerequisites: introductory courses in both art history and English literature. Permission of one of the instructors is required. (Crosslisted Art 52.)
Not offered 1985-86. Schmidt and Hungerford.

87. Film and Fiction.

A study of the ways in which narrative fiction is reshaped in the film medium and of the related but alternate realities in the comparative "texts." Texts will include the *Trials* of Kafka and Welles, a host of *Nosferatus*, the *Clockwork Oranges* of Burgess and Kubrick, and the Dark Hearts of Conrad and Coppola. Limited enrollment.
Spring semester. Williamson.

88. Women's Labors: 1830-1880.

An interdisciplinary investigation into the ways in which women's experiences and self-conceptions were shaped by mid-Victorian stereotypes about the nature of women. This is the second of two courses team-taught by members of the English and History departments of Swarthmore, Bryn Mawr, and Haverford Colleges.
Prerequisites: an introductory course in English. (Crosslisted as History 88.)
Fall semester. Poovey (Swarthmore) and Caplan (Bryn Mawr).

90. Criticism/Theory Colloquium.**

The colloquium this year will examine inscriptions of the feminine in Tudor and Stuart England as set out in the writings of Spenser, Shakespeare, Middleton, Webster, Milton, the English Sonneteers, Queen Elizabeth 1st, Mary Sidney Herbert, Amelia Lanier, Ann Boleyn, among others. We will also consider the "woman question" in such primary texts as devotional and domestic guides, autobiographies, letters, and The Book of Common Prayer. The course is committed, as well, to testing issues of power, gender, authority now under debate in contemporary critical theory

by refracting them through the lens of this earlier period.
Spring semester. Blum.

91. Colloquium: Lyric and Interpretation.**

Study of modes of interpretation and the stance of the interpreter through investigations of lyric. The course attends equally to practical and theoretical criticism and will focus on such issues as: poetic occasion, closure, intertextuality, feminist poetics, imitation, and marginality. Selected poems of such poets as: Wyatt, Raleigh, Marvell, Milton, Keats, Donnė, Dickinson, Bishop, Stevens, Rich, and a number of contemporary writers.
Not offered 1985-86. Blum.

92. Theory of the Novel.**

An examination of various narrative conventions, the interpretive problems raised by the genre, and some of the critical approaches contemporary theorists have taken to these problems. Novelists to be read include Defoe, Austen, Brontë, Conrad, and Calvino.
Fall semester. Poovey.

96. Directed Reading.

Students who plan directed reading must consult with the appropriate instructor and submit a prospectus to the Department by way of application for such work before the beginning of the semester during which the study is actually done. Deadlines for the receipt of written applications are the second Monday in November and the first Monday in April. Normally limited to juniors and seniors.

97. Shakespeare Conference.

(For course majors only.) Study of at least twenty-two plays, tracing the development of Shakespeare's craftsmanship and ideas. Required of course majors in the Department, who meet weekly in small groups during the fall semester. Students should read through the plays before beginning the course.
Two credits.
Fall semester. Snyder.

98, 99. Senior Essay, Senior Thesis.

In the fall semester of the senior year, Course majors in the Department may pursue a literary project (English 98) of their own choosing. The major part of the semester is devoted to preparing an essay (or essays) under the supervision of a member of the Department. A brief prospectus for the project must be submitted for approval by the Department in April of the junior year. Before submitting this prospectus, Course majors should consult with the Department Chairman and with the Department member who might supervise the project.

The project, culminating in an essay (or essays) of 20-25 pages, will be completed in December of the senior year. Students who do well on this project and wish to develop it into a comprehensive thesis will take English 99 in the spring semester. The work on the thesis will normally deepen or expand work completed during the fall.

THEATRE

1. Introduction to the Theatre.

This course includes sections on dramaturgy, acting, design, and directing. Theatre professionals from New York and Philadelphia meet with the class as possible. The course includes several short papers and an extended rehearsal period in which the class divides into groups and works on selected texts. Readings will be drawn from among the following: Chekhov, Pinter, Weiss, Brecht, Rozcwicz, Shepard, Aristotle, Artaud, Craig, Appia.
Prerequisite for advanced theatre courses.
Fall semester. Braun, Leff.

2. Techniques of Acting.

This is the basic acting course, the prerequisite for all others. It includes sections on history and theory of acting as well as intensive work on relaxation and concentration. Theatre 1 is not required as a prerequisite. Readings will be drawn from among the following: Stanislavski, Boleslavsky, Chaiken, Grotowski. Studio course; one credit.
Spring semester. Braun.

3. Production Workshop.

This course focuses upon and seeks to resolve specific production problems (scenery, lighting, audio, costuming, production management). Theatre 1 is not required as a prerequisite. May

be repeated once for credit. Studio course; one-half credit.
Spring semester. Leff.

5. Scene Study.

An acting studio for intermediate and advanced students who choose their own projects in acting technique and work on them with the instructor's supervision. May be repeated for credit.
Prerequisite: Theatre 2. Studio course; one-half credit.
Fall semester. Braun.

13. Theatre History.

The study of selected periods of theatre from a historical perspective. Emphasis on the manifestation of philosophical, political, and moral conditions in dramatic performance; consideration as well of the problematics of reading older texts within contemporary frames of performance. (Readings: Nicoll, Nagle, R. Gilman, P. Arnott, G. W. Knight, Pepys, V. Turner.)
Not offered 1985-86. Leff.

14. Introduction to Design.

The study of theoretical and historical foundations for contemporary theatrical design. Practical application of design principles in projects and exercises. (Readings: Appia, Craig, Braun, F. L. Wright, K. Burke, Bachelard, Giedion.)
Fall semester. Leff.

15. Advanced Design.

Extensive projects in support of the Ensemble classes; application of design principles to specific problems of period style, theatre architecture, and the collaborative process. (Readings: Kepes, Klee, G. Stein, C. Bell, V. Turner, Barthes, J. Berger.)
Spring semester. Leff.

16. Play Directing.

Study and application of the artistic principles that determine the conditions of performance, with special attention to the issues of acting, design, and the text. Class projects will be presented to the public as a final exercise. Meets with Advanced Design when possible; attends rehearsals at People's Light and Theatre Company. (Readings: Clurman, Stanislavsky, Foreman, Grotowski, Brecht, Brook.)
Spring semester. Braun.

17. Playwriting Workshop.

Projects in playwriting. Discussion of playscripts supported by some reading and analysis of appropriate models. Admission at the discretion of the instructor. Studio course; one credit.
Spring semester.

18. Performance Theory.

A study of the development and evolution of theories of performance as they apply to theatre and related arts. Authors will include Aristotle, Diderot, Nietzsche, Artaud, Grotowski, Roland Barthes.
Spring semester. Leff.

23. Ensemble I: Shakespeare.

This class rehearses and presents scenes in conjunction with courses and seminars in dramatic literature, principally Shakespeare. The work of the course includes research on performance history and presentations to the literature classes. May be repeated for credit. Studio course; one credit.
Fall semester. Braun.

24. Ensemble II: Actors and Texts.

The study and practice of dramatic choices. Using the works of a major modern playwright, the class will explore the process of moving from scripted text to dramatic art. Acting theory will include Stanislavsky, Boleslavsky, Brecht, Artaud, Brook, and Grotowski. During the last half of the course the ensemble will concentrate on selected scenes, one-acts, or a full-length play: this exercise will culminate in open rehearsals.
Prerequisite: Theatre 23. Studio course; one credit.
Fall semester. Wiliamson and Leff.

25. Ensemble III: Studies in Performance.

For the first half of the semester the class meets weekly, choosing a script and preparing for rehearsal (locating props, costumes, etc., learning lines, critically analyzing the play). The second half of the semester will begin with a brief, intense rehearsal period followed by public performance. This will in turn be followed by more rehearsal and another, more extended, public run.
Prerequisite: Theatre 23. Studio course; one credit.
Spring semester. Braun.

28. Directed Reading.

29, 30. Senior Essay.
An essay or production project prepared under the supervision of an appropriate faculty member. A prospectus must be submitted for approval in April of the junior year. Before submitting the prospectus, majors should consult with the Director and with the faculty member who might supervise the project. A one-credit project will normally be completed in the fall of the senior year. The fall work may serve as preparation for a larger project to be completed in the spring.
Staff.

SEMINARS

Group I

101. Shakespeare.
Study of Shakespeare as dramatist and poet. The emphasis is on the major plays, with a more rapid reading of the remainder of the canon. Students are advised to read through all the plays before entering the seminar.
Each semester. Staff.

102. Chaucer and Medieval Literature.
A survey of English literature, primarily poetry, from the 8th through the 15th century with an emphasis upon Chaucer. Texts will include *Beowulf* and other selected Old English poems, *Sir Gawain and the Green Knight*, Chaucer's *Troilus and Criseyde* and a major portion of *The Canterbury Tales*, *Piers Plowman*, *Pearl*, *Everyman*, selected mystery plays, and portions of Malory's *LeMorte d'Arthur*. Background readings will include selections from Andreas Capellanus and Boethius. Works in Chaucerian dialect will be read in Middle English; other works will be read in translation or in modernized versions. Modern analogies such as Gardner's *Grendel* and Bergman's *Seventh Seal* are occasionally included.
Not offered 1985-86. Williamson.

104. Milton.
Study of Milton's works with special emphasis on *Paradise Lost*.
Spring 1987. Blackburn.

105. Tudor-Stuart Drama.
The development of English drama from medieval morality plays to Jacobean tragedy and comedy.
Not offered 1985-86. Blackburn.

106. Renaissance Epic.
The two major English epics of the period, Spenser's *Faerie Queene* and Milton's *Paradise Lost*, considered in the context of the work of each poet and in relation to two antecedents, Virgil's *Aeneid* and Tasso's *Jerusalem Delivered*.
Spring semester. Snyder.

108. Renaissance Poetry.
Poetic modes and preoccupations of the English Renaissance, with emphasis on Sidney, Shakespeare, Spenser, Donne, Herbert, and Marvell.
Spring 1987. Snyder.

109. Eighteenth-Century Literature.
Examination of the literary forms and critical values of the age, with special attention given to the works of Dryden, Swift, Pope, and Johnson.
Not offered 1985-86. Pagliaro.

110. Romantic Poetry.
Examination of the poetry of Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats.
Fall semester. Pagliaro.

Group II

113. The English Novel.
Studies in English fiction from the eighteenth century to the present.
Fall semester. Weinstein.

115. Modern Comparative Literature.
Studies in fiction from Flaubert and Melville to the present. Fall and Spring reading lists will be different.
Each semester. Weinstein.

116. American Literature.**

A study of central writers of the American Renaissance, 1820-1865: Emerson, Hawthorne, Margaret Fuller, Thoreau, Melville, Walt Whitman, and Emily Dickinson. As well as closely reading selected texts, we will place these authors within a broad, interdisciplinary context, incorporating recent work by American studies scholars, including contemporary feminist historians, and Michel Foucault. Special emphasis will be given to the revolutionary aesthetic and social implications of Transcendentalism for views of religion, nature, language, industrialism, and the "woman's sphere" in society during the American Renaissance.
Fall semester. Schmidt.

118. Modern Poetry.

A study of the poetry and critical prose of Yeats, Eliot, and Stevens in an effort to define their differences and to assess their influence on later poets and theorists.
Spring 1987. N. Anderson.

119. Modern Drama.**

A survey of dramatic literature from Ibsen to the present. Texts will be examined both as scripts for living theatre and as literary and cultural documents. The seminar will visit various theatres, meet with actors and directors, and shape acting exercises. Secondary readings on dramatic theory, criticism, and intellectual history relevant to the plays under discussion will be assigned each week.
Not offered 1985-86.

120. Theory of Criticism.**

A course designed to provide a working knowledge of the major schools of contemporary criticism. In addition to questions of interpretation, issues addressed by these critics include the nature of language, the formation of the literary canon, and the social and political role of the critic. Theories to be studied include New Criticism, Structuralism, Post-structuralism, Psychoanalysis, Feminism, and Marxism.
Spring semester. Poovey.

121. Modern Black Fiction.

A comparative approach to black fiction of the United States, Africa, and the Caribbean. This study attempts a unity of themes arising out of shared experiences of heritage and exile—exile from sources, tradition, and landscape. Emphasis will be on works by Wright, Baldwin, and Morrison (U.S.A.), Achebe and Tutuola (Nigeria), McKay and Harris (Caribbean).
Not offered 1985-86. James.

180. Thesis.

A major in the Honors Program may elect to write a thesis as a substitute for one seminar. The student must select a topic and submit a plan for Department approval no later than the end of the junior year. Normally, the student writes the thesis, under the direction of a member of the Department, during the fall of the senior year.
Staff.

183. Independent Study.

Students may prepare for an Honors Examination in a field or major figure comparable in literary significance to those offered in the regular seminars. Independent study projects must be approved by the Department and supervised by a Department member. Deadlines for the receipt of written applications are the second Monday in November and the first Monday in April.
Staff.

History

MARGARET ANDERSON, Professor[3]
ROBERT C. BANNISTER, Professor
JAMES A. FIELD, JR., Professor Emeritus[5]
KATHRYN L. MORGAN, Professor
JEROME H. WOOD, JR., Professor
HARRISON M. WRIGHT, Professor
ROBERT S. DUPLESSIS, Associate Professor and Chairman[1]
WILLIAM JORDAN, Visiting Associate Professor[4]
LILLIAN M. LI, Associate Professor and Acting Chair[4]
MARJORIE MURPHY, Assistant Professor
ANDREW M. VERNER, Assistant Professor
LEILA BERNER, Lecturer[5]

COURSE OFFERINGS AND PREREQUISITES

The Department of History offers a range of courses of value to all students, from surveys to more specialized courses focusing on a specific period, theme, or subfield. All courses attempt to give students a sense of the past, an acquaintance with the social, cultural, and institutional developments that have produced the world of today, and an understanding of the nature of history as a discipline. The courses emphasize less the accumulation of data than the investigation, from various points of view, of those ideas and institutions—political, religious, social, and economic—by which people have endeavored to order their world.

Surveys are designed to serve the needs of students who seek a general education in the field, as well as to provide preparation for a range of upper-level courses. Freshman seminars explore particular issues or periods in depth. Although these entry-level courses vary somewhat in approach, they normally consider major issues of interpretation, the analysis of primary sources, and historical methodology.

Prerequisites: Surveys (numbered one through nine) are open to all students without prerequisites. Freshman seminars are open only to freshmen on the same basis. Upper-level courses are generally open to all students who have taken a survey in the same area, or who have Advanced Placement scores of 3-5 *in the same area*, or by permission of the instructor based on work in fields related to the subject of the course. Exceptions are courses "not open to freshmen" or where specific prerequisites are stated. For courses not clearly in the area of one of the surveys, please consult the instructor.

REQUIREMENTS FOR THE MAJOR

Prerequisites: The prerequisite for admission to the Department as a major in the Course or External Examination (Honors) Program or as a minor in the Honors program is normally at least two History courses taken at Swarthmore and a satisfactory standard of work in all courses. At least one of these history courses should be taken within the History Department, and preferably two for admission to Honors. Ideally preparation of the major should include at least one survey, and either a freshman seminar or upper-level course. Students who

1 Absent on leave, fall semester, 1985.
3 Absent on leave, 1985-86.
4 Fall semester, 1985.
5 Spring semester, 1986.

intend to continue their studies after graduation should bear in mind that a reading knowledge of one or two foreign languages (particularly French and German) is now generally assumed for admission to graduate school.

Major in the Course Program: The work of the major in course consists of at least eight (and normally no more than eleven) semester courses in the department plus a thesis, chosen so as to fulfill the following requirements:

(a) Course majors must fulfill certain departmental distribution requirements. For purposes of distribution the Department has divided its courses into four groups: (1) Ancient, Medieval, and Early Modern Europe through the 18th century; (2) Modern Europe (19th-20th centuries); (3) the United States; and (4) Africa, Asia, and Latin America. Course majors must take at least one course from each of these areas. Beyond that, majors are encouraged to concentrate informally in topics or areas of special interest to them, including at least three courses in the area of the senior thesis.

(b) Course majors must take History 91 (Junior Seminar) in the spring of the junior year. This course considers the nature and methods of historical research and involves the writing of an historiographical essay related to the topic of the senior thesis.

(c) Course majors in the fall of the senior year complete a single credit thesis (History 92) on the topic developed in the junior seminar.

Major and minor in the External Examination (Honors) Program: Candidates for Honors may elect history as a major or a minor in the Division of Humanities, in the Division of the Social Sciences, or in cross-divisional programs. Majors in the Honors Program may take either three or four seminars in the Department. Minors in the Honors Program are ordinarily expected to take at least two seminars.

ADVANCED PLACEMENT AND ATTACHMENT OPTIONS

Advanced Placement. The Department will automatically grant one semester's credit for incoming students who have achieved a score of 5 in Advanced Placement history tests. This credit may be counted toward the number of courses required for graduation. It may be used in partial fulfillment of the college distribution requirements. For majors, it may serve as partial fulfillment of the departmental distribution requirements listed above. Grades of 3 and 4 may serve as prerequisite for advanced courses in history in the same area (European or American) as the Advanced Placement course.

Language Attachment. Certain designated courses offer the option of a foreign language attachment, normally for one-half credit. Permission to take this option will be granted to any student whose reading facility promises the profitable use of historical sources in the foreign language. Arrangements for this option should be made with the instructor at the time of registration.

1. Early Europe.

Europe from the rise of Christianity to the end of the Middle Ages. This course will stress the uses of primary sources.
Not offered 1985-86.

2. Early Modern Europe.

From the late Middle Ages to the mid-eighteenth century, focusing on intellectual movements, varieties of state formation, and economic and social change.
Spring. DuPlessis.

3A. Modern Europe.

A topical survey from the Old Regime to the Cold War, with emphasis on the political, institutional, economic, and social forces that have shaped modern Europe. Topics include Enlightenment and religion, revolutions and reform movements, industrialization and the rise of the modern nation-states, imperialism, and world war.
Not offered 1985-86. Anderson.

3B. Modern European Society and Culture.

An introduction to the history of major ideas and intellectual movements in relation to social

realities and political action from the eighteenth to the twentieth century. Changing conceptions of the individual, state, and society are examined in historical context.
Fall. Verner.

4. Latin America.

The development of the Latin American area from preconquest times to the present. Emphasis is on the political, economic, and social development of Brazil, Mexico, and Argentina, and on recent attempts at radical transformation.
Optional Language Attachment: Spanish or Portuguese.
Spring. Wood.

5. The United States to 1877.

The colonial experience and the emergence of an American social order; Revolution and Constitution; the "first" and "second" party systems; humanitarianism and social control in the antebellum reform; slavery, the Civil War, and Reconstruction.
Fall. Bannister.

6. The United States since 1877.

Industrialism and the American social order; the welfare state from the Square Deal to the Great Society; world power and its problems; the 1960s and its legacy.
Spring. Murphy.

7. The History of the African American People.

This course is a topical survey of the historical legacy of the African American people. It begins with ancient black Egypt prior to the immigration of non-indigenous Africans to the Nile Valley. It studies the connection of ancient Egyptian culture with the rest of Africa, and the impact of African culture on Asia, Europe, and America, prior to the rebirth and expansion of Europe. The struggles of black men and women for liberation in the United States are seen as an "exciting chapter in the history of humanity." Topics include: blacks in science, black nationalism, black Muslims, black Jews, Pan Africanism, revolutionary Pan Africanism, and the Black Power idea.
Fall. Morgan.

8. Africa.

A survey of African history, with an emphasis on tropical Africa in modern times.
Spring. Wright.

9. Chinese Civilization.

An historical introduction to various aspects of traditional Chinese civilization and culture—language, literature, philosophy, art, imperial and bureaucratic institutions. The impact of Chinese civilization on other parts of Asia will be examined briefly.
Spring. Li.

10A. Freshman Seminar: The Crusades.

The history of the crusading movement from its beginnings in eleventh century papal ideology through the fall of Constantinople to the Turks in 1453. The emphasis will be less on the military campaigns than on West European political and social change brought about by exposure to Islam. Open to freshmen only. Enrollment limited to ten. Preference given to freshmen entering with Advanced Placement score of 3 or better in European History.
Not offered 1985-86.

10B. Freshman Seminar: The Third Reich and the Holocaust.

An intensive examination of the origins, ideology, and operations of the Nazi regime, its extension across Europe, and responses of victims and collaborators. Open to freshmen only. Enrollment limited to ten. Preference given to freshmen entering with Advanced Placement score of 3 or better in European History.
Optional Language Attachment: German.
Not offered 1985-86. Anderson.

10C. Freshman Seminar: The Great War

An examination of the political, social, and diplomatic setting of the European war of 1914 to 1918 and of its effects on the major participants. The period studied will be roughly from 1870 to 1920. Open to freshmen only. Enrollment limited to ten. Preference given to freshmen entering with Advanced Placement of 3 or better in European history.
Not offered 1985-86.

10D. Freshman Seminar: The Cold War Era.

A focused examination of the origins and persistence of the cold war from the globalization of containment to the pressure of domestic conflict. Topics include: the Eisenhower-Dulles years, Kennedy's Crisis Management, LBJ and Vietnam, Nixon/Kissinger's Detente,

Truman's Decisions to Drop the Bomb and subsequent nuclear policy decisions. Open to freshmen only. Enrollment limited to ten. Preference given to freshmen entering with Advanced Placement of 3 or better in American history.
Not offered 1985-86. Murphy.

10E. Freshman Seminar: The Invasion of America.

A study of pre-Columbian America and a comparative analysis of interactions between Indians and Europeans in colonial Spanish and British America. Open to freshmen only. Enrollment limited to ten. Preference given to freshmen entering with Advanced Placement of 3 or better in American history.
Fall. Wood.

Classics 21. Ancient Greece.

(See listing under Department of Classics.)

Classics 31. History of Greece.

(See listing under Department of Classics.)
Not offered 1985-86.

Classics 32. The Roman Republic and Augustus.

(See listing under Department of Classics.)

Classics 42. Greece in the Fifth Century B.C.

(See listing under Department of Classics.)

Classics 44. The Early Roman Empire.

(See listing under Department of Classics.)
Not offered 1985-86.

11. Early Medieval Europe.

The history of western Europe from the accession of Diocletian to the last Carolingians.
Not offered 1985-86.

12. Later Medieval Europe.

The history of western Europe from the tenth to the fifteenth century, with emphasis on the role of the Papacy.
Not offered 1985-86.

13. Medieval England.

The political, cultural, and religious history of England from the Roman occupation to 1485.
Not offered 1985-86.

14. Medieval European Intellectual History.

The history of ideas in western Europe from the fifth to the fourteenth century, with roughly equal attention being paid to the development of political theory, theology, philosophy, education, and science.
Not offered 1985-86.

15. Medieval European Historiography.

Writings on history, from Augustine to Froissart, and the Middle Ages, from the fifteenth century to the present, will be studied. The course's purpose is to identify changes in each period's conception of the Middle Ages.
Not offered 1985-86.

16. The Twelfth Century.

A study of the most rapid period of change in the Middle Ages, seen through the careers of seven representative figures: Abelard, Bernard, John of Salisbury, Henry Plantagenet, Barbarossa, Louis VII, and Pope Alexander III.
Not offered 1985-86.

17. The Medieval Mediterranean World.

Through maritime trade, military conquest (Crusade), and cultural interchange, the Christian West and the Islamic East came face-to-face with each other in the medieval Mediterranean world. Approaching the topic from a social-historical perspective, this course will examine the culturally and religiously pluralistic character of medieval Mediterranean society and the degree to which Christians, Muslims, and Jews interacted with each other socially, economically, culturally, and religiously. While important events and personalities from several areas will be studied, emphasis will be on medieval Spain as a characteristic locus for the intermingling of the Mediterranean peoples. No prerequisite.
Spring. Berner.

18. The Civilization of the High Middle Ages in Europe.

An analysis of institutions, social and economic structures, and forms of thought and expression from about 1050 to about 1350. Emphasis is placed on the elements of medieval civilization that have influenced the subsequent history of European peoples. No prerequisite.
Fall. Jordan.

19. The Renaissance.

The emergence of a new culture in the city-states of Italy between the fourteenth and early sixteenth centuries, studied in relation to the political, economic and social context. Emphasis on cultural developments including humanism, art, historiography, and political thought.
Not offered 1985-86. DuPlessis.

23. Tudor and Stuart England.

The transformation of England in the sixteenth and seventeenth centuries, from the Reformation to the Glorious Revolution. Topics include the Tudor polity, political revolt and the emergence of parliamentary monarchy, the recasting of the social structure, the rise of a capitalist economy, and the course of religious conflict and change.
Spring. Duplessis.

24. The Rise of Capitalism.

The transition from agrarian feudalism to industrial capitalism in Europe from the fourteenth to the nineteenth centuries. Emphasis on varying patterns of agrarian transformation, restructuring of industrial production, expansion of the market, class formation, economic thought, and ideology. Analysis of theories about the origins of capitalism and industrialization. Some discussion of development in Eastern Europe, but most attention is given to Western Europe, particularly England and France.
Not offered 1985-86. DuPlessis.

25. Women, Society and Change in Modern Europe.

A topical study of European women from the later Middle Ages to the twentieth century. Issues to be considered include working women in preindustrial and industrial economies, family life, sexuality and reproduction, women's collective action, the rise of feminism.
Optional Language Attachment: French.
Not offered 1985-86. DuPlessis.

29. Victorian England.

England from the 1830's to the end of the nineteenth century. Topics will include landed and industrial society, the poor and reform; piety and morality; liberalism and its aesthetic and moral critics; Ireland; Splendid Isolation and Empire; and representative figures of the age.
Not offered 1985-86. Anderson.

32. Europe of the Dictators, 1914-1945.

The assault of radical politics, left and right, on the social and political fabric of Europe; the interaction of domestic and international conflict; the crisis of industrial capitalism; nationalism, militarism, racism; the first effective experiments in the use of ideology, technology, and terror as means of social control.
Optional Language Attachment: German.
Not offered 1985-86. Anderson.

33. The European Left.

Leftist movements and ideologies in the nineteenth and twentieth centuries from pre-Marxian socialism to post-Leninist communism. Topics include the changing nature of social protest, the transformation from corporate to class society, "utopian and scientific" Marxism, anarchism, trade unionism and electoral politics, class consciousness and mass action, war and revolution, the responsibilities and alienation of power.
Spring. Verner.

34. Revolutionary France.

The transformation of France from the *ancien régime* to the 1848 revolution: the crisis of old regime state and social structure, Enlightenment thought and the revolution of 1789, Sans-Culottism, revolutionary war and terror, Napoleon, restoration and reaction, 1830 and the July Monarchy.
Fall. Verner.

35. Culture and Politics of Modern France.

An examination of nation, citizen, and class from the July Monarchy to the Fifth Republic. Topics include the revolution of 1848, middle classes and bourgeois culture, rise of the working class, Bonapartism and Commune, Republican synthesis and stability, radicals and the church, anti-Semitism, polarization and disintegration, World War II—collaboration and resistance, rebirth of the republic and end of empire, Gaullism.
Not offered 1985-86. Verner.

36. Modern Germany.

The development of Germany from a collection of small towns and small states to the lynch-pin of the present European balance of power. Topics will include: the formation of an imperial state and its grasp for world power; the conflict between agrarian ideals and industrial imperatives; democratization and the search for a national identity; cultural efflorescence and political breakdown; the youth movement, anti-semitism, and National Socialism; divided Germany and the "undigested" Germany past.
Optional Language Attachment: German.
Not offered 1985-86. Anderson.

37. Medieval and Imperial Russia.
From the ninth century origins of Kievan Rus to Russia's emergence as the Gendarme of Europe in the nineteenth century. Topics include the Mongol yoke, the evolution of Tsarist autocracy since Ivan the Terrible, slavery and serfdom, the relationship between the Orthodox church and the state, Westernization, the origins of the intelligentsia, and the disintegration of the Petrine service class system.
Not offered 1985-86. Verner.

38. Revolutionary and Soviet Russia.
A century of continuity and change from Alexander II to Brezhnev. Topics include bureaucratic reform and reaction in the autocratic state, the intelligentsia tradition, Russian Marxism and the revolutionary movement, the transformation of an agrarian economy, the dilemma of Russian liberalism, the revolutions of 1905 and 1917, Leninism versus Stalinism, de-Stalinization.
Spring. Verner.

41. The American Colonies.
The foundations of American civilization, 1607-1763. Topics treated include: the development of representative government; denominationalism and religious toleration; the emergence of a new social structure; racism and ethnic relations; and England's imperial policy.
Not offered 1985-86. Wood.

42. The American Revolution.
The conflict between intensive self-government in the colonies and English ideas and projects for empire; the revolt against colonial status and the elaboration of a "republican" ethos and "republican" institutions, 1763-1789.
Not offered 1985-86. Wood.

43. Jeffersonianism and the American Experience.
An interdisciplinary course which focuses intensively on contrasts between the Jeffersonian view of man and America and other perspectives in American politics, constitutional law, social theory, religion, literature, and architecture. Limited enrollment.
Prerequisite: History 5, 6 or equivalent,or the permission of the instructor.
Not offered 1985-86. Wood.

44. America in the Progressive Era, 1896-1920.
Modernization, social control, and the rise of the corporate state. Topics include the control of industry, scientific management, socialism and the social settlements, Jim Crow, eugenics and birth control, the women's movement, social science and the rise of the "expert," advertising and the roots of consumerism.
Fall. Bannister.

45. The United States Since 1945.
The Cold War and McCarthyism; domestic politics from Truman to Reagan; suburbanization, technological change and mass society; the New Left and the counterculture; Civil Rights and Black Power; women's liberation; Watergate and the Imperial Presidency; Vietnam; revival on the Right.
Spring. Murphy.

46. Topics in American Intellectual History.
Selected themes, varying from year to year. Tentative topic for 1986-87: Science and Society. Not open to freshmen.
Not offered 1985-86. Bannister.

47. America and the World: to 1900.
The American role in world affairs from the Revolution through the War with Spain; independence and westward expansion; ideological and economic interaction with Europe and the outer world; the growth of industrial power and the problem of "imperialism."
Spring. Field.

48. America and the World: since 1900.
New responsibilities in the Caribbean and the Far East; the expansion of American economic and cultural influence; two world wars and the effort to prevent a third; the American "challenge" and the American "empire."
Not offered 1985-86. Field.

49. Introduction to American Diplomatic History.
A chronological approach to diplomatic history in the modern world with emphasis upon the emergence of the U.S. as a world power. In the period from 1789 to the fall of Saigon, we will examine conflicting historical interpretations of foreign policy; influences of internal politics, culture, and technology in the making of foreign policy; military and strategic thought, international conflict, and the issues of non-

involvement and intervention in a progressively interdependent world.
Fall. Murphy.

52. Education in America.

(Also listed as Education 52.) A history of primary, secondary, and higher education in America from the European and colonial origins to the present. The course will consider both theory and practice within the context of American society and culture, and in relation to other agencies of socialization.
Prerequisite: Permission of the instructor.
Not offered 1985-86. Bannister.

53. Black Culture and Black Consciousness.

Exploration into the relationship between black culture and black consciousness with emphasis placed on twentieth century America. Limited enrollment. Readings and student reports form the core materials for the course. Learning through discussions only. Seminar format.
Prerequisite: Previous work in history, or permission of the instructor.
Spring. Morgan.

54. Women, Society, and Politics.

Women in American society from the colonial period to the present, with emphasis on the changing nature of work and the separation of spheres, the rise of feminism, and the resistance to women's rights. Not open to freshmen.
Fall. Murphy.

55. The Making of the American Working Class.

A colloquium on the history of the industrial revolution in America. Includes a comparison with Great Britain; technology and invention; concepts of time and work discipline; cultural expressions of class formation; community and social change; research methods, new social history, and cliometrics. The principal focus is a cooperative research project on which individual papers are written.
Fall. Murphy.

56. Ex-Slave Narratives.

An exploration of slavery and slave folklife as reflected in ex-slave reminiscences. Emphasis is placed on the relationship of the narratives to the understanding of the black experience in the United States.
Prerequisite: History 5, 6, 7, or 8, or the permission of the instructor.
Not offered 1985-86. Morgan.

57. Oral History.

By examining the living past this course seeks to emphasize the relevance of history to modern life with special emphasis on American subject matter. Students will be taught the skills requisite for the completion of an original research project that involves the collection, classification, and analysis of data selected from both written and oral sources. General discussion topics include folk religion, the role of the family, local and personal history, and old ways in the new world. Some work will be done off campus.
Prerequisite: Prior work in history or permission of instructor.
Fall. Morgan.

58. The World of DuBois, Rogers, and Diop.

This course deals with the impact of the writings of three black twentieth century intellectuals on our knowledge of world history in general and the contributions of Africa to world civilizations in particular. First, the ideas of W.E.B. DuBois; second, research on sex and race in writings of J. A. Rogers; third, African origins of civilization in writings of C. A. Diop.
Prerequisite: Introductory history course or the permission of the instructor.
Fall. Morgan.

Religion 17. History of Religion in America.

(See listing under Department of Religion.)
Not offered 1985-86.

Religion 18. Quakerism.

(See listing under Department of Religion.)
Not offered 1985-86.

63. South Africa.

A survey of South African history with an emphasis on Black-White relations and on the development of contemporary problems.
Fall. Wright.

66. Topics in Latin American History.

Thematic as well as regional and national approaches varying from year to year. Topic for spring 1986: The Caribbean Basin: History and the Contemporary Situation.

Prerequisite: History 4 or the permission of the instructor.
Optional Language Attachment: Spanish or Portuguese.
Spring. Wood.

67. The African in Latin America.

The history of black people in French, Portuguese, and Spanish America: slavery, emancipation, the contemporary scene. Special attention will be given to the impact of African civilization on Latin countries, as well as to comparative analysis of the experience of blacks in that region and in the United States.
Optional Language Attachment: Spanish or Portuguese.
Fall. Wood.

68. Food and Famine: Past and Present.

The production, distribution, and consumption of food have affected the relationship of peoples to their natural and social environments. This course will consider how different societies have fed their populations, how the current world food problem differs from historical subsistence crises, and how food affects economic development and international relations.
Prerequisite: prior work in History or permission of the instructor.
Not open to freshmen.
Spring. Li.

72. Japanese Civilization.

Japan's history from its origins to the early nineteenth century tracing its dominant political, intellectual, religious, and cultural patterns.
No prerequisite.
Fall. Li.

74. Modern China.

The history of China since the early nineteenth century. Topics include the impact of the West, reform and revolution, nationalism, and the development of the communist movement.
No prerequisite.
Fall. Li.

75. Modern Japan.

The transformation of Japan into a modern nation-state, from the early nineteenth century until the present.
No prerequisite.
Spring. Li.

77. China: The Politics of History.

This course will examine, with particular emphasis on political influences, the historiography of China from three perspectives: 1) the relationship of the traditional Chinese view of the past to the Confucian state; 2) major ideological controversies from the late nineteenth century to the present; 3) the changing views of Western observers and historians, both popular and scholarly. Limited enrollment.
Prerequisite: History 9, History 74, or the permission of the instructor.
Not offered 1985-86. Li.

84. Folklore and Folklife Studies.

(Also listed as English 84.) An introduction to the major forms of folklore and selected forms of folklife materials. The course includes the study of myth, legend, folktales, proverbs, jokes, riddles, and other verbal arts including folk music. It explores superstition, witchcraft, magic, and popular beliefs; and considers the function of folklore in highly industrialized modern societies as well as in traditional ones.
Prerequisite: Prior work in history or literature.
Spring. Morgan.

87. History Through Folklore and Literature.

A comparative analysis of folklore and literature. Emphasis will be placed on attitudes toward life among selected cultural groups in the twentieth century, primarily but not exclusively in the United States. Themes include loneliness and friendship, love and death, vocation and avocation, life after death, and the resurgence of the occult in United States popular culture. Focus for 1985-86: Indigenous Americans (Indians) and selected topics of student interest for special presentations. Limited enrollment. Learning through discussion only.
Prerequisite: Previous work in history, or permission of the instructor.
Spring. Morgan.

88. Women's Labors: 1830-1880.

(See 88, listed under Department of English Literature.)
Fall. Poovey.

89. Women Working, Women Writing.

An interdisciplinary investigation into the experience and meaning of women's labor and discourse in the nineteenth and twentieth centuries.

Prerequisite: An introductory course in History.
Spring. Not offered 1985-86. Murphy.

90. Problems in Historiography.

Readings and discussion centering on the nature of historical writing, on the relationship of historians to their times and cultural environments, and on historical method and its problems. Limited enrollment. Open to majors and, with the permission of the instructor, to non-majors.
Spring. Wright.

91. Junior Seminar.

Required of all course majors, this seminar considers issues in the research and writing of history. In the first part of the semester, works embodying various conceptual and methodological perspectives will be discussed; in the second, students will prepare historiographical essays designed to become the first chapter of their senior theses.
Spring. Members of the department.

92. Thesis.

A single credit thesis, required of all course majors, on a topic developed in the junior seminar.
Fall. Members of the Department.

93. Directed Reading.

Individual or group study in fields of special interest to the student not dealt with in the regular course offerings. The consent of the chairman and of the instructor is required. History 93 may be taken for one-half credit as History 93A.
Members of the Department.

SEMINARS

The following seminars are offered by the Department, when possible, to juniors and seniors who are preparing to be examined for a degree with Honors. They may be taken without regard to chronological order. Some preliminary reading or other preparation may be required for seminars on subjects in which no work has previously been done.

111. Medieval Europe.

Western Europe from the Papal-Frankish alliance of the eighth century to about 1300.
Not offered 1985-86.

116. The Renaissance.

Topics in the development of the Renaissance state, society and culture in Italian communes between the fourteenth and sixteenth centuries. Issues addressed include forms of political and economic organization, varieties of humanism, political theory, changing historical consciousness, art and society. Much attention is devoted to historiography.
Fall 1986. DuPlessis.

117. Europe in the 16th and 17th Centuries.

State, society and economy in continental Western Europe from the sixteenth to the mid-eighteenth centuries, with emphasis on France, Spain, and the Netherlands. Focus on the disparate patterns of state formation, economic development and social change; the relations between economic and political transformation; political thought and ideology. Considerable attention will be given to comparisons among states, the transition to capitalism, the crisis of the seventeenth century, the origins and functions of absolutism.
Spring 1986. DuPlessis.

118. Tudor and Stuart England.

The rise of parliamentary monarchy and capitalist economy through religious reform, political revolution and socio-economic transformation. Topics include popular rebellion, the causes and nature of the two revolutions of the seventeenth century, the rise of the gentry and crisis of the aristocracy, enclosure and agrarian change, the sources of English economic growth, Puritanism and political revolt, the relation between science and religion.
Fall. Not offered 1985-86. DuPlessis.

119. Early Modern European Intellectual and Cultural History.

European thought and culture in its social context from the breakup of cultural unity following the Renaissance to the emergence of a new synthesis during the Enlightenment. Topics include the theology, appeal and institutionalization of the magisterial, radical and counter Reformations; rationalism and pessimism; popular mentalities and witchcraft; intellectual and educational institutions; printing, literacy,

and the diffusion of learning; "high" and "low" Enlightenments. Attention will be given to conceptual and methodological issues in the study of cultural history.
Spring 1987. DuPlessis.

122. Revolutionary Europe 1750 to 1870.

Selected topics in the social, economic, and political history of France, England, and Germany from the *ancien régime* to German unification. Special emphasis on the origins and nature of the French Revolutions, the industrial revolution in England and its consequences, class structure and conflict, German nationalism and the failure of liberalism.
Fall. Verner.

124. England, 1815-1914.

The adjustments of an aristocratic society to the impact of industrialization. Topics include: the nature of the English aristocracy; the origins and impact of the industrial revolution; popular radicalism and the development of a working class consciousness; philosophic radicalism and the origins of the welfare state; the rise of modern political parties and modes of politics; Gladstone and Disraeli; religious revival, respectability, and Victorian morality; imperialism; Fabianism, feminism, and trade-unionism; the problem of Ireland and the growth of Irish nationalism.
Fall 1986. Anderson.

125. Fascist Europe.

A comparative study of the social, intellectual, and historical origins and development of Mussolini's Italy, Franco's Spain, and Hitler's Germany. Some attention will also be given to the Arrow Cross and Iron Guard movements of Horthy's Hungary and King Carol's Romania. Theories of Fascism will be examined.
Spring 1987. Anderson.

126. Europe in the Liberal Era, 1870-1918.

By 1870 constitutions, parliaments, and a liberal economy were in place throughout most of Central and Western Europe. This seminar will examine these liberal structures, as well as the challenges to them and their assumptions posed by social and economic change; developments in social theory; the rise of anti-liberal ideologies and movements (such as racism, anti-Semitism, and ethnic nationalism); the birth of mass politics, feminism, political Catholicism, and international socialism; and the Great War. Emphasis will be on the Great Powers—Britain, France, Germany, and the Hapsburg Empire—but some attention will be paid to Italy and Spain.
Not offered 1985-86. Anderson.

128. Russian Empire in the 19th and 20th Centuries.

From Emancipation to de-Stalinization. Salient themes in Russian and Soviet history including autocratic politics and bureaucratic reform, the role of social groups such as the intelligentsia, nobility, peasantry, and workers, problems of economic development, revolutionary theory and practice, Leninist and Stalinist alternatives of the Soviet system.
Spring 1986. Verner.

130. Early American History.

Political, economic, social, and cultural aspects of the period from the explorations to the early National era.
Spring. Wood.

132. American Political History.

Parties, public policy, and constitutional issues from 1787 to 1960 in their social, economic, and cultural context. Topics include the shaping of the constitution; "republicanism," "democracy," and the first and second party systems; slavery, the Civil War and the constitution; the social bases of campaign styles and strategies; the emergence of the regulatory-welfare state; experts, interest groups, and the decline of voter participation; the making of the modern presidency.
Fall. Bannister.

134. American Diplomatic History.

A study of the evolution since 1776 of American relations with the outer world with emphasis on ideological, economic, and strategic developments.
Spring. Field.

135. American Social History.

The structures of everyday life in nineteenth and twentieth century America. Topics include fertility, mortality, and migration; industrialization and the family; slavery and its aftermath; mechanization and changing patterns of work; social mobility, urbanization and suburbanization; gender, class, and ethnicity.
Spring 1986. Murphy.

136. American Intellectual History.

Political, social, and literary culture from the

late eighteenth century through World War I.
Spring. Bannister.

140. Modern Africa.

Studies in sub-Saharan African history with emphasis on the period since 1800.
Spring. Wright.

141. South Africa.

South Africa from the seventeenth century to the present.
Fall. Wright.

144. Modern China.

China from the late eighteenth century to the present. Topics include: social and intellectual currents in the late imperial era; Western imperialism; rebellions, reforms, and revolution; political and social transformation in the People's Republic of China.
Fall. Li.

148. Latin America.

Selected topics in Latin American history.
Fall. Wood.

180. Thesis.

With the permission of the Department, Honors candidates may write a thesis for either single or double course credit. Double-credit theses will normally be written in the fall semester of the senior year for submission as papers to the visiting examiners. Honors candidates wishing to write a thesis for single (non-Honors) credit should elect History 92.

International Relations

Coordinator: **RAYMOND F. HOPKINS**

Students who plan to enter upon a career in some field of international affairs may wish to graduate with a concentration in international relations. Such students should include in their programs, during the first two years, introductory courses in economics, history, and political science and should complete the intermediate course in one or more modern languages.

Advanced courses selected from the groups listed below may be incorporated in the programs of students who do their major work in economics, history, political science, or modern language.

Concentrators are required to have satisfactorily completed eight or more course units from among those listed below, including all those listed in Group I, one or more in Group II, and one or more in Group III.

Group I

Political Science 4.
International Politics

Political Science 14, or
Political Science 105.
American Foreign Policy

Economics 30 or
Economics 105.
The International Economy

Group II

History 4.
Latin America

History 8.
Africa

History 32.
Europe of the Dictators, 1914-1945

History 36.
Modern Germany

History 38.
Revolutionary and Soviet Russia

History 48.
America and the World: since 1900

History 74.
Modern China

History 75.
Modern Japan

History 125.
Fascist Europe

History 128.
Russian Empire

History 134.
American Diplomatic History

History 140.
Modern Africa

History 144.
Modern China

History 148.
Latin America

Group III

Economics 11.
Economic Development

Economics 31.
Comparative Economic Systems

Economics 81.
Economics of the Middle East

Economics 106.
Comparative Economic Systems

Economics 109.
Economic Development

Political Science 3.
Comparative Politics

Political Science 18.
Political Development

Political Science 19.
Comparative Communist Politics

Political Science 20.
Politics of China

Political Science 21.
Politics of Africa

Political Science 22.
Latin American Politics

Political Science 41.
Defense Policy

Political Science 43.
Food Policy: National and International Issues

Political Science 55.
Modern Political Theory

Political Science 58.
International Political Theory

Political Science 104.
International Politics

Political Science 107.
Comparative Communist Politics

Political Science 108.
Comparative Politics: Europe

Political Science 109.
Comparative Politics: Africa and the Third World

Political Science 110.
Comparative Politics: Latin America

In planning the concentration students should consult with the coordinator. Where appropriate, work taken abroad is encouraged and may be counted toward the concentration requirements. Students standing for external examination for a degree with honors must take examinations in four subjects taken for the concentration, normally including international politics, American foreign policy, and international economics. Students in the course program will take a special comprehensive examination program worked out with their major department, concentration coordinator, and the student. The comprehensive exam will normally follow the format used by the major department.

Linguistics

ALFRED BLOOM, Associate Professor and Program Director[7] [2]
MARCIA LINEBARGER, Lecturer
SUSAN G. WILLIAMSON, Social Sciences Librarian

Linguistics is the study of language. On the most general level it deals with the internal structure of languages, the history of their development and the role they play in influencing the entire spectrum of human activity. *Linguistics* attempts to arrive at an adequate description of the phonological, syntactic, and semantic components of language, differentiating those elements which are generic to all languages from those which are particular to any given language or family of languages. *Historical linguistics* looks at the evolution of these components over time. *Sociolinguistics* centers on the link between language and the social context in which it is spoken; *mathematical linguistics* on the formal analysis of linguistic structures; and *psycholinguistics* on the interplay between language and the processes of perception and cognition. Futhermore, linguistic variables influence interaction at the individual and societal levels, play a central role in shaping the form and meaning of literary expression and constitute a significant area of philosophical inquiry. Special majors bridging linguistics with individual foreign languages, the humanities or the social sciences are encouraged for Course students. All such programs are designed on an individual basis to suit the interests of the student, but it is highly recommended that Linguistics 108 be included at some point in the course sequence.

The Honors Major of Linguistics consists of a minimum of three external examination preparations. Honors candidates in addition are required to include Linguistics 108 in their programs and to have developed competence in at least one foreign language beyond the intermediate level through an advanced course or an introductory literature course. All Honors Linguistics majors are encouraged as well to write a thesis in their senior year and to organize their prior course and seminar work so that they will be prepared to begin this project in the fall of their senior year.

1. Language—An Introduction.
An introduction to language and its multifaceted interaction with human thought and behavior. The first part of the course will concentrate on the description of the internal structure of language, providing a grounding in the principles of structural linguistics, transformational grammar, and semantic theory. The second part will turn from a description of internal structure to brief explorations into the role played by linguistic variables in psychological processes and development, philosophical inquiry, socio-political interaction, and artistic creation.
Spring semester.

15. The Chinese Language
(See Chinese 15.)

21. History of the French Language
(See French 20.)

25. Language, Culture, and Society.
An investigation of the influence of cultural context and social variables on verbal communication. We will discuss theories of language acquisition and language change in light of cross-linguistic and cross-cultural evidence. The course includes readings from the three major fields of language and culture studies; ethnography of communication, sociolinguistics, and sociology of language. Language projects in the community are included. Prerequisite: Linguistics 1 or permission of the instructor. (Crosslisted as Sociology/Anthropology 25.)
Fall semester. Williamson.

26. Philosophy of Language.
(See Philosophy 26.)

34. The Psychology of Language.
An exploration into the ways in which the syntactic and meaning elements of language are represented in the mind and into the effects these psycholinguistic structures may have on the way we think, with special emphasis on an

2 Absent on leave, spring semester, 1986.
7 Joint appointment with psychology.

attempt to interpret philosophical and sociological (including feminist) views in terms of psychological theory and research and on cross-cultural perspectives.
Spring semester.

52. Historical Linguistics.
An introduction to historical linguistics: the reconstruction of prehistoric linguistic stages, the establishment of language families and their interrelationships, and the examination of processes of linguistic change on all levels, phonological, morphological, syntactic, and semantic.
Not offered 1985-86.

56. Moral Thinking.
(Cross-listed as Psychology 56.) An investigation into the role played by cognitive dimensions in influencing moral and moral behavior, with emphasis on adolescence and beyond. An attempt will be made to place the investigation within a framework provided by current trends in cognitive psychology, existential philosophy, and linguistics and to draw on the implications of these dimensions with respect to the relationship of the individual to the nation-state and the international system.
Not offered 1985-86.

60. Language Acquisition.
An examination of the process by which children learn their first language. Stages in the acquisition of phonology, syntax, and semantics; language acquisition and universal grammar; the issue of biological specialization for language.
Prerequisite: Linguistics 1 preferred, but this requirement may be met through additional reading.
Not offered 1985-86..

61. Psycholinguistic Approaches to Aphasia.
The language disorders that result from brain damage are a potentially rich source of evidence about language processing, bearing on such questions as: Can language and thinking break down independently of one another? Are the psychological processes involved in working out the syntactic structure of a sentence distinct from those involved in assigning it a meaning? Can knowledge of word meaning break down independently of other linguistic capacities? The course focuses upon the surprising insights that the study of aphasia contributes to our knowledge of how human beings process language.
Prerequisites: Ling. 1 or Psych. 3 or permission of instructor.
Fall semester. Linebarger.

93. Directed Reading or Research.
Students may conduct a reading or research program in consultation with the instructor (permission of the instructor required).
Each semester. Staff.

96, 97. Senior Paper.
Both semesters. Staff.

Other courses of particular interest to students of Linguistics:

Chinese1B-2B. Introduction to Mandarin Chinese.

Russian 16. History of the Russian Language.

Greek 19. Comparative Grammar of Greek and Latin.

SEMINARS

104. Human Nature and Culture: Convergent Perspectives.
(See Sociology/Anthropology 104).

107. Language and Thought.
An intensive investigation of selected linguistic, psychological and philosophical approaches to the elusive interaction of language and thought. Emphasis will be placed on developmental and cross-cultural perspectives, and students will be encouraged to undertake independent research projects in their specific areas of interest.
Prerequisite: Either Linguistics 1, or Psychology 3, or permission of the instructor.
Fall semester. Bloom.

108. Syntactic Theory.
A comparison of models of linguistic description with emphasis on recent developments in

syntax and semantics. (Formerly Contemporary Approaches to Descriptive Linquistics.) Prerequisite: Linguistics 1 and 20 or permission of the instructor.
Not offered 1985-86.

110. Semantics.
Theories of meaning in generative grammar. The relationship between syntax and semantics; quantification, negation, and logical form; reference in natural language; the interaction between semantics and pragmatics.
Prerequisite: Linguistics 1.
Spring semester. Linebarger

116. Philosophy of Language.
(See Philosophy 116.)

180. Thesis
Each semester. Staff.

Literature

Coordinator: **HAROLD E. PAGLIARO**

The Literature major is administered by a Literature Committee representing the Departments of Classics, English Literature, and Modern Languages and Literatures. The basic requirement for a major in Literature is work in two or more literatures in the original language. A student who intends to major in Literature will submit to the Literature Committee a proposed program of integrated work which sets forth the courses or seminars to be taken and the principle of coherence upon which the selection is based. The Committee will review the proposal and advise the student. Subject to the requirement of serious study of at least two literatures in the original language, one of which may be English, work in translation is encouraged, especially as it consists of thematic or comparative courses. In lieu of a regular course, the Literature Committee will consider proposals for an individual or cooperative project, for one or more research papers written as course attachments, or for the substitution of a thesis for course credit when these projects have as their purpose either the integration of work within the major or the relating of work outside the major to some portion of the major.

For a major in the Course Program the requirements are as follows:

1. A minimum of ten courses in two or more literature departments, including a substantial concentration of work—normally not fewer than five courses—in one of the departments. Only courses numbered 11 or above in Classics and Modern Languages and Literatures are counted as constituents of the Literature major. Of English courses numbered 2 through 10, only one may be counted for the major.

2. A senior essay planned early in the first semester of the senior year. The senior essay counts for at least one credit, usually for two credits, and is thus a paper of considerable scope or intensiveness in which a theme or result of the student's individual program of work is developed. In some cases the Committee may require that the essay be written in whole or in part in a language other than English.

3. A comprehensive examination taken in the second semester of the senior year.

For a major in the External Examination (Honors) Program the requirements are as follows:

Not fewer than five papers in Literature, including at least three in one department and significant work done in a foreign language, ancient or modern. Literature majors in the Honors Program are encouraged to include in their program a thesis with the purpose of integrating the work of the major in accordance with the principle of coherence on which the program is based.

Literature Majors in Course will meet with members of the Literature Committee before the end of the Junior Year to review and assess informally the student's progress under his or her proposal of study.

Majors in Course or in the External Examination Program are asked to submit to the Coordinator a prospectus of their thesis no later than two weeks after the beginning of the student's senior year.

Prospective majors in Literature are urged to make their plans early so as to acquire the necessary linguistic competence by the junior year.

The courses and seminars that compose the Literature major's formal field will naturally differ with each major. Attention is called, however, to the following comparative offerings presently listed in the Catalogue:

CEL 13. Medieval Comparative Literature.
CEL 14. Modern European Literature.
SAL 50. Contemporary Spanish-American Literature.
English 70. Renaissance Comparative Literature.
English 72. Proust, Joyce, Faulkner.
English 73./French 75. Proust/Joyce.
English 74. Modern Drama.
English 76. The Black African Writer.
English 115. Modern Comparative Literature.

Mathematics

JAMES W. ENGLAND, Professor and Provost[6]
GUDMUND R. IVERSEN, Professor of Statistics
CHARLES F. KELEMEN, Professor of Computer Science and Mathematics
EUGENE A. KLOTZ, Professor[2]
DAVID ROSEN, Professor
J. EDWARD SKEATH, Professor and Chairman
STEPHEN B. MAURER, Associate Professor
CHARLES M. GRINSTEAD, Assistant Professor
HELENE SHAPIRO, Assistant Professor
DON H. SHIMAMOTO, Assistant Professor

We live in a time when mathematics is cutting across more and more disciplines; there now exist such specialties as mathematical economics, mathematical linguistics, mathematical sociology, mathematical psychology, and mathematical biology, along with more traditional areas such as mathematical physics. Other relatively new disciplines such as Computer Science and Operations Research rely heavily on both mathematics and engineering. In recognition of this, the mathematics curriculum includes a wide variety of courses in applications related areas in addition to the many courses in areas of pure mathematics. Moreover, the Mathematics Department is quite interested in facilitating the creation of joint majors, and also in developing carefully worked out programs which involve a concentration in mathematics and some other discipline.

First Year Courses: Mathematics courses available to first semester freshmen with normal high school preparation include Math 1 (Statistics for Observational Data), Math 3 (Basic Mathematics), Math 5 (Calculus I), Math 7 (Introduction to Computer Science), and Math 9 (Discrete Mathematics). In the second semester, Math 2 (Statistics for Experimental Data), Math 4 (Calculus Concepts), and Math 9 (Discrete Mathematics) are available, again with only normal high school preparation. Students with some calculus background from high school may take Mathematics 6 by passing the Calculus I placement exam, Mathematics 16 by passing the departmental Calculus II placement exam, or Mathematics 16H by passing the departmental Calculus II placement exam and receiving departmental approval. All freshmen planning to enroll in Mathematics 3, 5, 6, 9, 16, or 16H at some time are required to take the appropriate departmental placement exams given during freshmen orientation.

Advanced Placement Policy: Advanced placement credit in Mathematics, that is, Swarthmore College credit in mathematics for work done before a student enters Swarthmore, is subject to the following regulations: 1) One course credit will be given for a score of 4 or 5 on the AB or BC Advanced Placement Test, or a passing score on the Departmental Calculus I Placement Exam administered during freshman orientation week. 2) Two course credits will be given for a passing score on the Departmental Calculus II Placement Exam administered during freshman orientation week. Students can obtain a maximum of two credits under items 1 and 2. 3) Advanced Placement credit will only be given to entering students at the beginning of their first semester at Swarthmore.

Computer Science: The Computer Science Program at Swarthmore works in close cooperation with the Engineering and Mathematics Departments to offer a broad spectrum of courses that may lead to a Concentration in Computer Science. For details refer to the Computer Science Program portion of this bulletin.

Secondary Teaching Certification: Whether or not one majors in Mathematics, the courses required as part of the accreditation process for teaching mathematics at the secondary level are: a) three semesters of calculus (Math 5, 6, 18); b) at least one of discrete mathematics

2 Absent on leave, spring semester, 1986.
6 On administrative assignment, 1985-86.

(Math 9) or computer science (Math 7); c) geometry (Math 45); d) one semester of modern pure or applied algebra (Math 37, 48, or 49); e) one semester of statistics or probability (Math 23 or 41). For further information about certification requirements, consult the Education Department (see page 107 of this catalog).

Statistics: Students who do not know calculus can take Math 1 or 2, with the choice determined by their intended major. Both courses lead to Math 13 on multivariate statistical analysis. Students who know calculus should take Math 23 and students with a strong background in mathematics can take the more theoretical Math 53. Both courses lead to Math 57 on multivariate analysis. Students who want a seminar in statistics can take Math 111.

Requirements for a major in Mathematics: The normal preparation for a major in mathematics is to have obtained credit by the end of the sophomore year for at least 4 of the following 5 courses: Calculus I (Math 5), Calculus II (Math 6), Discrete Mathematics (Math 9), Linear Algebra (Math 16 or 16A or 16H) and Several Variable Calculus (Math 18 or 18H). In any event, Math 16 and Math 18 must be completed by the first semester of the junior year. (Incoming students may obtain credit for Math 5 through the Advanced Placement Calculus test or they may obtain credit for Math 5 or Math 6 through the department placement exams administered during orientation week.)

Students apply for a major in the middle of the second semester of the sophomore year. In addition to the course requirements above, candidates should normally have a grade point average in Mathematics courses to date of at least C+. This should include at least one grade at the B level. Marginal applicants may be deferred pending successful work in courses to be designated by the department. Requirements for acceptance as a Mathematics major in the External Examination Program are more stringent and include a grade point average in Mathematics courses of B+ or better. Additional evidence such as successful work in a "muscle-building" course like Math 33 is highly desirable. Students in the course program are also encouraged to include Math 33 in their program at a reasonably early date.

By graduation a mathematics major must have at least 10 credits in mathematics courses; at most 5 of the credits counted in the 10 may be for courses numbered under 25. Furthermore, a major must receive at least one credit for "core analysis": Foundations of Real Analysis (Math 33), Applied Analysis I (Math 81), Applied Analysis II (Math 82), Topics in Analysis (Math 85), or Real Analysis (Math 101A); and one credit for "core algebra": Topics in Algebra (Math 48), Introduction to Modern Algebra (Math 49), or Modern Algebra (Math 102A). Number Theory (Math 37) may also be included under "core algebra" in years when that course is taught from an algebraic point of view. Finally, course majors must also pass either the Departmental Comprehensive examination or the senior conference, only one of which will be available in any given year.

Potential candidates for the External Examination Program in Mathematics may want to consider including Math 33 in their sophomore year. Such students should discuss the advisability of this with the department chairman at an early date. A mathematics major in the External Examination program will normally take Math 101A and B and 102A and B in the junior year and two other seminars.

Mathematics majors are urged to study in some depth a discipline which makes use of mathematics. All mathematics students are urged to acquire some facility with the computer. Students bound for graduate work in mathematics should obtain a reading knowledge of French, German, or Russian.

Special emphases:

A student majoring in Mathematics with emphasis on statistics would be required at the advanced level to take: a) one course in the core analysis group; b) Probability (Math 41) or the probability seminar (Math 105); c) Mathematical Statistics (Math 53) or the statistics seminar (Math 111) for one or two credits; d) Multivariate Statistics (Math 57) or, perhaps, Econometrics (Econ 108). Math 111 for 2 credits meets c and d; e) another mathematics course numbered 25 or above. Students are encouraged but not required to select this course from the core algebra group.

Recommended Major for students thinking of graduate work in social or management science, or an MBA. Basic courses: Calculus I (Math 5), Calculus II (Math 6), Introduction to Computer Science (Math 7), Discrete Math (Math 9), Linear Algebra (Math 16), and Several Variable Calculus (Math 18).

Advanced courses: a) Modeling (Math 61); b) at least one of Probability (Math 41), Mathematical Statistics (Math 53), or Statistics Seminar (Math 111); c) at least one of Mathematical Programming (Math 64), Combinatorics (Math 65), Mathematical Algorithms (Math 73), or Operations Research (Econ 57); d) a core analysis course and a core algebra course; e) Differential Equations (Math 30). Since this is a heavy program (someone hoping to use mathematics in another field must have a good grasp both of the mathematics and of the applications), one of the core course requirements may be waived with permission of the department.

Recommended Major Program for students thinking of graduate work in Discrete Mathematics or Operations Research. Basic courses: Mathematics 5, 6, 7, 9, 16, and 18. Advanced courses: a) the two core course requirements; b) two of Mathematical Programming (Math 64), Combinatorics (Math 65), or Mathematical Algorithms (Math 73); c) either Probability (Math 41) or Probability seminar (Math 105); d) one of Mathematical Statistics (Math 53), Modeling (Math 61), or Numerical Methods (Math 67).

1. Statistics for Observational Data.

Data for one variable are examined through averages and measures of variation. Relationships between variables are studied using methods such as chi-square, rank correlation, and regression analysis. The main examples are taken from sample surveys and governmental data, and the course is intended for students in political science, sociology, and related disciplines making use of observational data. The course does not satisfy any mathematics prerequisite, except for Math 13, nor can it be counted toward a major or minor in the Department.
Fall semester. Iversen.

2. Statistics for Experimental Data.

Data for one variable are examined through averages and measures of variation. Relationships between variables are studied using methods such as chi-square, rank correlation, analysis of variance, and regression analysis. The main examples are taken from experimental research, and the course is intended for students in biology, psychology, and related disciplines making use of experimental data. The course does not satisfy any mathematics prerequisite, except for Math 13, nor can it be counted toward a major or minor in the Department.
Spring semester. Iversen.

3. Basic Mathematics.

This course focuses on two objectives (1) review and remedial work, and (2) preparation for calculus. Some special attention will be given to those whose previous experience with mathematics has not been entirely prosperous. Prospective students should take the Basic Skills Test during Orientation Week, preferably at the Math Exam time. (The results will be used to help determine both classroom topics and individual strengths and weaknesses.) Subject matter will be taken from logic, algebra, trigonometry, and geometry. This course cannot be counted toward a major in the Department.
Fall semester. Grinstead.

4. Calculus Concepts.

This course, which covers the basic concepts of one variable calculus, is particularly useful for biology and social science majors. Topics to be included are sequences, series, differentiation, integration, transcendental functions, and extremal problems.
Spring semester. Staff.

5, 6. Calculus I and II.

The first semester will cover topics in differentiation and integration of functions of one variable with some applications. The second semester is a continuation of the first. Topics covered in the second semester include series, improper integrals, differential equations, and techniques of integration. Math 6 may be taken in the fall semester by passing the departmental Calculus I placement exam. All students planning to enroll in 5 or 6 in the fall semester are required to pass the appropriate departmental placement exam. Students taking Math 5 or 6 in the fall semester are strongly encouraged to take the half credit attachment, Math 6A (cross-

listed as Physics 5, Economics 5), Computing from the User's End, see course description below.
5. *Fall semester.* 6. *Each semester.*

6A. Computing from the User's End.

(Also listed as Physics 5 and Economics 5.)
A practical introduction to computer use including interactive operating protocol, the BASIC language, and graphics and statistical packages. Assumes no prior background in computing or physics. One intensive lecture plus a workshop session per week; one-half credit course. Some of the workshops will be included in regular Physics Labs. There will be a separate workshop stressing applications appropriate to Math 5 and 6 for students taking 6A but *NOT* taking Physics 1 or 3. This course cannot be counted toward a major in Mathematics.
Fall semester. Boccio.

7. Introduction to Computer Science.

(Also listed as Computer Science 15.)
This course is an introduction to computer science for students from all disciplines. The major emphasis of the course is on problem solving and algorithm development. Students are introduced to the Pascal programming language and gain proficiency in it by writing programs to solve a number of illustrative problems. Students are also informally introduced to many topics in computer science including: hardware organization; system software; programming style and documentation; program testing and verification; fundamental data structures such as arrays, records, and linked lists; basic algorithms for searching and sorting; analysis of algorithms; computability; and artificial intelligence.
Prerequisite: Computing from the User's End (Physics 5) or its equivalent.
Each semester. Fall semester. Christensen.

9. Discrete Mathematics.

An introduction to noncontinuous mathematics. The key theme is how induction, iteration, and recursion can help one discover, compute, and prove solutions to various problems—often problems of interest in computer science, social science, or management. Topics include algorithms, graph theory, counting, difference equations, and finite probability.
Prerequisite: 4 years of high school mathematics. The level of sophistication (but not background) is similar to Math 16 or 18. Familiarity with some computer language is helpful but not necessary.
Each semester. Fall semester. Maurer.

13. Multivariate Statistical Analysis.

Given as a continuation of Math 1 or 2, the course deals mainly with the study of relationships among three or more variables. Included are such topics as multiple regression analysis, with multiple and partial correlation, several variable analysis of variance and the analysis of multidimensional contingency tables. The course ends with an introduction to Bayesian methods. The course does not satisfy any mathematics prerequisite nor can it be counted toward a major or minor in the Department.
Prerequisite: Math 1 or 2 or 23 or 53 or Econ 4 or Soc/Anthr 18 or 19 or 20.
Alternate years.
Not offered 1985-86.

16. Linear Algebra.

The subject matter of this course consists of vector spaces, matrices, and linear transformation with application to solutions of systems of linear equations, determinants, and the eigenvalue problem.
Prerequisite: A grade of C or better in Math 6 or Math 9 or a passing grade on the departmental Calculus II placement exam.
Each semester.

16H. Linear Algebra Honors Course.

This honors version of Mathematics 16 will be more theoretical, abstract, and rigorous than its standard counterpart (the subject matter will be equally as valuable in applied situations, but applications will not be dwelt upon). It is intended for students with exceptionally strong mathematical skills, and primarily for students who enter with BC Advanced Placement calculus courses.
Prerequisite: A grade of B or better in Math 6 or Math 9 or a passing grade on the departmental Calculus II placement exam.
Fall semester. Maurer.

16A. Linear Algebra and Differential Equations.

This course will cover the main topics of Linear Algebra (Math 16) and Differential Equations (Math 20) in one semester and is an alternative to taking both Math 16 and Math 30. These two subjects are closely related. Differential

equations requires certain techniques from linear algebra and at the same time provides examples and applications of many concepts of linear algebra. Topics: Linear algebra—matrices, vector spaces, solutions to linear systems, determinants, eigenvalues, linear transformations. Differential equations—linear differential equations (constant and non-constant coefficients), The Wronskian, Power series methods, systems of differential equations. As time permits: orthogonality and least square approximations. Level and pace will be the same as for Math 16.
Prerequisite: Grade of C or better in Math 6.
Fall semester. Skeath.

18. Several Variable Calculus.

This course considers differentiation and integration of functions of several variables with special emphasis on two and three dimensions. Topics include partial differentiation, extreme value problems, LaGrange multipliers, multiple integrals, line and surface integrals, Stokes' and Green's Theorems.
Prerequisite: Math 6 or equivalent.
Each semester.

18H. Several Variable Calculus Honors Course.

This honors version of Mathematics 18 will be more theoretical, abstract, and rigorous than its standard counterpart (the subject matter will be equally as valuable in applied situations, but applications will not be dwelt upon). It is intended for students with exceptionally strong mathematical skills, and primarily for students who have successfully completed Math 16H.
Prerequisite: A grade of C or better in Math 16H or permission of the instructor.
Spring semester.

23. Statistics.

This calculus-based introduction to statistics covers most of the same methods examined in Math 1 and 2, but the course is taught on a higher mathematical level. The course is intended for anyone who wants an introduction to the application of statistical methods.
Prerequisite: Math 5.
Fall semester. Iversen.

30. Differential Equations.

An introduction to differential equations that includes such topics as: first order equations, linear differential equations, approximation methods, some partial differential equations.
Prerequisite: Math 18 and 16 or permission of the instructor.
Spring semester.

33. Foundations of Real Analysis.

This course is designed to give the student an understanding of basic theorems of calculus. The student is also expected to learn how to construct a mathematical proof. This course is recommended for students majoring in mathematics in course and for students planning to major in mathematics in honors.
Spring semester.

37. Number Theory.

The theory of primes, divisibility concepts, and the theory of multiplicative number theory will be developed. Potential secondary school teachers should find this course valuable.
Prerequisite: permission of the instructor.
Alternate years.
Not offered 1985-86.

41. Probability.

This course deals with the mathematical theory and concepts of probability including an introduction to stochastic processes.
Prerequisite: Math 6, and 9 or 18, or permission.
Alternate years. Fall semester.
Not offered 1985-86.

45. Geometry.

Synthetic and analytic projective geometry will be considered axiomatically. Affine and Euclidean geometry will be developed as special cases. Recommended for potential secondary school teachers.
Alternate years.
Fall semester. Rosen

46. Theory of Computation.

(Also listed as Computer Science 46.)
The study of various models of computation leading to a characterization of the kinds of problems that can and cannot be solved by a comoputer and, for those problems that can be solved, a means of classifying them with respect to how difficult they are to solve. Topics to be covered include: formal languages and finite state devices, Turing machines, and other models of computation, computability, and complexity.
Prerequisite: Comp. Sci. 35
Spring semester. Kelemen.

48. Topics in Algebra.

Course content varies from year to year and is dependent on student and faculty interest. Recent offering have included Algebraic Coding Theory, Groups and Representations. Topic for 1985: Finite Reflection Groups.
Prerequisite: Math 16.
Alternate years.
Fall semester. Shimamoto.

49. Introduction to Modern Algebra.

The course will survey some of the important topics of modern algebra, such as groups, integral domains, rings, and fields.
Prerequisite: Math 16 or permission of the instructor.
Alternate years.
Not offered 1985-86.

51. Science, Decision-Making, and Uncertainty.

A study of decision-making as it relates to scientific and public policy matters. The course covers philosophical, psychological, and mathematical aspects of decision-making in the face of uncertain evidence. Topics covered include the nature of scientific evidence and experimentation; probabilistic evidence and the law; uncertainty and medicine; inferential vs. Bayesian statistics; human decision-making, rational and irrational techniques, and correctives of decision-making. The theories will be related to such public issues as nuclear power, hazardous waste disposal, vaccination programs, and strategic nuclear planning.
Spring semester. Iversen, Kellman, and Holt.

53. Mathematical Statistics.

Based on probability theory, this course examines the statistical theory for the estimation of parameters and tests of hypotheses. Both small and large sample properties of the estimators are studied. The course concludes with the study of models dealing with relationships between variables including chi-square and regression analysis.
Prerequisites: Math 16 and 18 or permission.
Alternate years.
Spring semester. Iversen.

57. Multivariate Statistics.

Given as a continuation of Math 23 or 53, the course deals mainly with statistical models for relationships between variables. The general linear model, which includes regression, variance, and covariance analysis, is examined in detail. The course concludes with nonparametric statistics, sampling theory, and Bayesian statistics.
Prerequisite: Math 23 or 53.
Alternate years.
Not offered 1985-86.

61. Modeling.

An introduction to the methods and attitudes of mathematical modeling. Since modeling in natural science and engineering is already taught in courses in those disciplines, applications in this course will be primarily to social and biological sciences. Various standard methods used in modeling will be introduced: differential equations, Markov chains, game theory, graph theory, computer simulation. However, the emphasis will be on how to apply these subjects to specific modeling problems, not on their systematic theory. The format of the course will include projects as well as lectures and problem sets.
Prerequisites: Math 16 and 18, or instructor's permission.
Alternate years.
Not offered 1985-86.

64. Mathematical Programming.

Linear Programming and its extensions: the simplex method, duality, assignment problems, network flows, two-person game theory, and an introduction to non-linear programming. Numerous algorithms are discussed, and there will be opportunities for computer implementation. A different perspective on mathematical programming is available in Engineering/Economics 57, Operations Research. In comparison, Mathematics 64 is more advanced mathematically in that there is more emphasis on theory, and linear algebra is used to present it. However, Engineering 57 is more extensive in that engineering economics and probabilistic decision models are also covered, and case studies are involved. A student may take both courses; together they form a strong introduction to the theory and practice of optimization.
Prerequisites for Math 64: Math 9 and 16, or instructor's permission.
Alternate years.
Spring semester. Maurer.

65. Combinatorics.

Advanced counting, including generating functions and Polya's Theorem. Graph Theory,

including connectivity, cycle, and coloring theorems. Other combinatorial structures such as matroids, designs, and codes. The Pigeonhole Principle and Ramsey Theory. Depending on interest, numerous applications to social, biological, and management sciences. Topics will be chosen to complement, but not overlap, Math 64 and Math 73. May be combined with Math 64 or Math 73 for an external examination paper.
Prerequisites: Math 9 and at least one other course in Mathematics.
Alternate years. Fall semester.
Not offered 1985-86.

67. Numerical Methods.

This course will deal with the numerical solution of various mathematical problems, pure and applied. The computer will be used extensively. Also listed as Engineering 27.
Prerequisite: Math 6 and Math 7 or E23 or equivalent.
Alternate years.
Not offered 1985-86.

73. Mathematical Algorithms.

This course considers the construction, analysis, and theory of algorithms for solving mathematical problems. Included are algorithms for constructing all or random combinatorial objects, e.g., subsets, permutations, partitions, algorithms on graphs, e.g., graph coloring and shortest paths, and complexity of algorithms and the theory of NP-Completeness. Overlap with Mathematics 64, Mathematical Programming, and Computer Science 35, Fundamental Structure of Computer Science, will be minimized by avoiding lengthy discussion of algorithms studied in those courses.
Prerequisite: Math 7 and 9 and/or further courses in mathematics and computing.
Alternate years.
Fall semester. Grinstead.

81. Applied Analysis I.

Topics include: Fourier series, the Fourier transform, orthogonal functions, introduction to Hilbert space, and operators. The motivation for these topics will be in partial differential equations arising in the physical sciences. May be taken with Applied Analysis II for an external examination paper.
Prerequisite: Math 16A or 30 or permission of the instructor.
Fall semester. Rosen.

82. Applied Analysis II.

Analytic functions, integration and Cauchy's Theorem, power series, residue calculus, conformal mapping, and harmonic functions will be considered. The emphasis of this course is on applications to the physical sciences. May be taken with Applied Analysis I for an external examination paper.
Prerequisite: Math 18.
Spring semester.

85. Topics in Analysis.

Course content varies from year to year and is dependent on student and faculty interest. Recent offerings have included Differential Geometry, Functional Analysis.
Prerequisite: Math 18.
Alternate years.
Not offered 1985-86.

93. Directed Reading.

96. Thesis.

97. Senior Conference.

This half course is designed to give students an overview of all of their mathematics courses by solving a variety of mathematical problems. Most recently this has been accomplished by way of a written thesis and an oral presentation on a mathematical topic agreed upon by the student and the instructor. When offered, this course replaces the departmental comprehensive examination.
Half course credit.
Spring semester.

SEMINARS

101A. Real Analysis I.

This seminar concentrates on the careful study of the principles underlying the calculus of real valued functions of real variables. Topics will include pointset topology, compactness, connectedness, uniform convergence, Stone Weierstrass Theorem. Normally taken with Math 101B for an external examination paper. May however be taken with 101B.
One credit.
Fall semester. Skeath.

101B. Real Analysis II.

A continuation of the material in Math 101A. Topics will include the inverse and implicit function theorems, differential forms, and Lebesgue integration.

One credit.

Spring semester as enrollment warrants. Definitely will be offered at least every other year including Spring 1987.

102A. Modern Algebra I.

This seminar is an introduction to abstract algebra. The standard algebraic systems—groups, rings, fields, modules, and vector spaces—are studied. While these concepts will be illustrated by many concrete examples, the emphasis will be on abstract theorems and proofs, and rigorous, mathematical reasoning. The first semester, 102A will focus on groups and rings. Normally taken with Math 102B for an external examination paper. May however be taken without 102B.

One credit.

Fall semester. Shapiro.

102B. Modern Algebra II.

This is a continuation of 102A. Topics covered usually include field theory, Galois theory (including the insolvability of the Quintic), the structure theorem for modules over principal ideal domains, and a theoretical development of linear algebra. However, other topics may be studied, depending on the interests of students and instructor.

One credit.

Spring semester as enrollment warrants. Definitely will be offered at least every other year including Spring 1986.

Spring semester. Shapiro.

103. Complex Analysis.

A brief study of the geometry of complex numbers is followed by a detailed treatment of the Cauchy theory of analytic functions of a complex variable. Various applications are given and some special classes of functions, such as elliptic functions, are studied. Analytic continuation and the theory of Weierstrass are also discussed.

Alternate years.

Not offered 1985-86.

104. Topology.

The subject matter of this seminar will include such topics as point set topology with some applications, piecewise linear topology, homology, and homotopy theory.

Alternate years.

Spring semester.

105. Probability.

This seminar concentrates on discrete probability theory. The ideas of sample space and probability distribution are introduced. The binomial and Poisson distributions are studied, and the normal distribution is introduced. Laws of large numbers and the Central Limit Theorem are discussed. Other topics include the idea of randomness, generating functions, random walk problems, and Markov chains.

Alternate years.

Fall semester. Grinstead.

111. Mathematical Statistics.

Properties of random variables are studied together with ways of inferring about parameters in statistical models. Special emphasis is put on the study of models for relationships between random variables.

Alternate years.

Not offered 1985-86.

Medieval Studies

Coordinator: **JEAN ASHMEAD PERKINS**

This program offers an opportunity for a comprehensive study of European and Mediterranean civilization from the fourth century to the fifteenth. The period, which has a critical importance for the understanding of Western culture, can be approached best through a combination of several disciplines. Hence eight Departments (Art, Classics, English Literature, History, Modern Languages, Music, Religion, and Philosophy) cooperate to provide a course of study which may be offered as a major in either the course Program or the External Examination (Honors) Program.

For a major in the Course Program the requirements are as follows:

1. Latin 14, Mediaeval Latin
   1 course in Medieval History (History 11 or 12)
   Either Religion 37/Philosophy 19 or History 14

The prerequisites for the courses listed above are:

Latin 1-2 or the equivalent; an introductory history course; Philosophy 1.

2. Five other courses chosen from three of the following fields:

   Art History (15, 16, 17).
   History (11, 12, 13, 14, 15).
   Religion (35, 37).
   Literature (Classics 35; English 20, 21, 22; CEL 13, French 20 and 30; Spanish 41).
   Music (20).
   Other courses appropriate to Medieval Studies that are from time to time included in departmental offerings.
   Directed readings in medieval subjects.

3. A student may write a thesis as a substitute for a course during the first semester of the senior year.

4. The student must pass a comprehensive examination in the senior year based on courses taken in the medieval field. The examination includes a section of Latin translation.

For a major in the Honors Program the requirements are as follows:

1. The student must satisfy the language and distribution requirements of the program, as listed above, by appropriate courses or seminars. Some work in one or more of the fields, included in the program must be done before admission to the Program.

2. Seminars may be chosen from the following: Philosophy 110 (Medieval Philosophy), History 111 (Medieval Europe), Art History 117 (Gothic Art), English 102 (Chaucer and Medieval Literature) or French 100 (Litterature du Moyen-Age).

3. By attachments to the courses listed above, and by writing a thesis, the student may expand the possibilty of work in the Honors Program beyond these five seminars.

The minor program should be planned with the coordinator so as to insure a close relation to the major. No minor in Honors is offered. Students wishing to minor in subjects included in this field should take them as minors in the department in which they are normally offered.

Modern Languages and Literatures

GEORGE C. AVERY (German), Professor[3]
THOMPSON BRADLEY (Russian), Professor
GEORGE KRUGOVOY (Russian), Professor
PHILIP METZIDAKIS (Spanish), Professor
JEAN ASHMEAD PERKINS (French), Professor and Chairman, 1983-86
ROBERT ROZA (French), Professor[10]
SIMONE VOISIN SMITH (French), Professor[9]
FRANCIS P. TAFOYA (French and Spanish), Professor
EUGENE WEBER (German), Professor[1]
MARION J. FABER (German), Associate Professor (part-time)
JOHN J. HASSETT (Spanish), Associate Professor[1]
GEORGE MOSKOS (French), Associate Professor[8]
KENNETH C. LUK (Chinese), Assistant Professor
MONIKA SHAFI (German), Instructor
WEI CHANG (Chinese), Lecturer
EDWARD DIXON (German), Lecturer
EVGENIYA L. KATSENELINBOIGEN (Russian), Lecturer
ROBERT KATZ (Spanish), Lecturer
MARY K. KENNEY (Spanish), Lecturer
CAROLE NETTER (French), Lecturer
ELKE PLAXTON (German), Lecturer
PIERRE TRABUT (French), Assistant

The purpose of the major is to acquaint students with the important periods and principal figures of the literatures taught in the Department, to develop an appreciation of literary values, to provide training in critical analysis, and to foster an understanding of the relationship between literary phenomena and the historical and cultural forces underlying the various literary traditions. In addition to demonstrated competence in the language, a foreign literature major will normally complete seven credits in literature courses or seminars, take Special Topics, and pass the comprehensive examination. Students whose interests lie primarily in language are advised to consider the possibility of a Modern Languages major. Those with an interest in civilization should consider a Special Major in combination with History, Art, or some other appropriate department. Students interested in studying literature in more than one language are encouraged to consider a Literature major.

Courses numbered 1B through 8 are primarily designed to help students acquire the linguistic competence necessary to pursue literary studies in a foreign language through work with the language and selected texts of literary or general interest.

For a detailed description of the orientation in these courses see the Explanatory Note on language courses below. Courses numbered 11 or above emphasize the study of literature as a humanistic discipline as well as competence in the spoken and written language.

1 Absent on leave, fall semester, 1985.
3 Absent on leave, 1985-86.
8 Campus coordinator, Grenoble Program.
9 Program Director, Swarthmore Program in Grenoble, fall semester, 1985.
10 Program Director, Swarthmore Program in Grenoble, spring semester, 1986.

Students who plan to major in a foreign language and its literature are advised to present sufficient credits on admission to enable them to enroll in courses numbered 11 and 12 in their freshman year. Students who enter with no previous knowledge of the language and are interested in majoring in a foreign literature should register for the intensive language courses (1B-2B) in the freshman year. Language courses numbered 1B through 5 (8 in German) do not count toward the minimum of eight credits required for the major.

Students who wish to continue a language begun elsewhere will be placed at the course level where they will profit best according to their score in the College Entrance Examination or placement tests administered by the Department in the fall.

Prerequisites for majors are noted under the listing of each of the literatures taught. Exceptions to course requirements are made for those who show competence in the language of specialization. Students who speak French, German, Russian or Spanish fluently should consult with the Department before electing courses.

Majors are urged to elect supporting courses in other literatures, in history, philosophy, linguistics, or art history. The Department also recommends participation for a minimum of a summer and a semester in an academic program abroad. Linguistically qualified students may apply to the Swarthmore Program at the University of Grenoble, for one or two semesters in the sophmore or junior year. This program is particularly suited for majors in the humanities and the social sciences. Students competent in Spanish should consider the Hamilton College Program in Madrid, Spain, which is cooperatively sponsored by Swarthmore. Those competent in German should consider the Wayne State Junior Year in Germany (at the University of Munich or the University of Freiburg) or the Smith College Junior Year at the University of Hamburg. Students interested in intermediate and advanced Chinese studies in China are encouraged to consider the China Educational Tours program in Beijing and the Nankai University program in Tianjin, the People's Republic of China. Students on scholarship may apply scholarship monies to designated programs of study abroad, in addition to the Hamilton College Program in Madrid and the Swarthmore Program in Grenoble (see Education Abroad, p. 52-54).

Students wishing to receive a Teaching Certificate in French, German, Russian or Spanish should plan on taking the regular program of language and literature courses required for the major or show proof of the equivalent. In addition, they should take Linguistics 1 or a course in the history of the language offered in the Department. Appropriate supporting courses which broaden knowledge and understanding of the foreign culture being studied are also recommended. Prospective teachers of a foreign language should plan to include a minimum of a summer and a semester abroad in their academic program.

Students planning to do graduate work are reminded that, in addition to the language of specialization, a reading knowledge of other languages is often required for admission to advanced studies.

Continental European and Spanish American Literatures (in translation)

Students acquainted with a particular foreign language are urged to elect an appropriate literature course taught in the original language. CEL/SAL courses provide students with the opportunity to study literature which they cannot read in the original. These courses may be used to satisfy the distribution requirements, but cannot be substituted for the 11 or 12 level courses to satisfy the departmental prerequisites for a major or minor in the original languages. In some cases CEL/SAL courses may form an appropriate part of supporting upper-level work, part of a Literature Major, or they may serve as the basis of preparation for an Honors paper. Students planning programs where such considerations

might apply should consult with the Department.

Normally, at least one CEL or SAL course is offered each semester; these courses are announced before fall and spring registration. Other, cross-listed courses in foreign literature in translation are listed after SAL 50.

12R. Russian Thought and Literature in the Quest for Truth.

The development of Russian intellectual tradition as reflected in Russian philosophy and literature from the 18th century to the present. Brief consideration of Russian medieval literature and thought. Eighteenth century: secularization of culture. Nineteenth and twentieth centuries: philosophical and literary polemics within the framework of current secular ideologies and religious thought. Russia and the West and the dream of a Perfect World.
Spring semester 1986. Krugovoy.

13R. The Russian Novel.

See Russian 13.

13. Mediaeval Comparative Literature.

The tension between ideals and their realization as reflected in the literature of the Middle Ages, especially the epic *(Roland, Cid, Nibelungen)* and the romance *(Tristan, Yvain, The Grail).*
Spring semester 1986. Perkins.

14. Modern European Literature.

Contributions in theme and form to a European tradition of modern fiction will be examined and compared in seminar format (presentation and critical discussion of student papers). Authors will include Dostoevsky, Rilke, E. M. Forster, Thomas Mann, Virginia Woolf, and Malraux. Intended especially for freshmen and sophomores contemplating a Literature major. Limited enrollement.
To be offered 1986-87.

20G. The Contemporary German Novel.

A study of intellectual, literary, and sociological currents in East and West Germany, Austria, and Switzerland since the end of World War II as they appear in representative works of prose fiction. Authors include Heinrich Böll, Günter Grass, Max Frisch, Uwe Johnson, Peter Handke, and Christa Wolf. Lectures and discussions in English. German majors will be required to read some of the works in German.
To be offered 1986-87.

25R. Russian Folklore and Russian Culture.

A study of folk poetry in its cultural and artistic aspects. Folklore and the genesis of literature and civilization. Survivals of myth and ritual in Russian folk poetry and their significance for the understanding of the collective psychological dominants in Russian cultural outlook will be discussed. Special attention will be given to ritual poetry, tales, heroic epic, and lyric poetry with extensive use of comparative evidence from non-Russian folk traditions. Representative texts will be analyzed in class with active participation by students.
Not offered 1985-86. Krugovoy.

50G. Studies in Modern German Literature.

Under this course title topics will be offered from year to year that reflect the richness and variety of literature in German-speaking countries, against the background of this century's dominant social and cultural crises. Courses to be offered in subsequent years include: The Novels of Thomas Mann; Modern German Criticism from Nietzsche to Benjamin; German Expressionism; Austrian Writers of the 20th Century; Nietzsche and his Literary Influence; Literature and Film in Weimar Germany.
Current offering: *Twentieth Century German Women in Film and Literature.* Beginning with an examination of early 20th century theories and representations of women (Freud, Wedekind, Schnitzler, von Sternberg), this course will then concentrate on the feminine and/or feminist response, particularly after World War II. Film makers such as Leontine Sagan, Margarete von Trotta, and Helke Sander, as well as writers such as Anna Seghers, Ingeborg Bachmann, and Christa Wolf will form the basis for an examination of how gender influences questions of morality and aesthetics in film and literature. The influences of changing political contexts on the representation of gender will also be a central focus.
Spring semester. Faber.

30R. The Petersburg Theme in Russian Literature.

Literary and historical perspectives of the urbanistic theme in Russia. Petersburg as a social reality, demonic delusion, and myth. Alienation in the modern city, individual search for self-identification, and personal reintegration in a meaningful cosmos. Readings

and discussions based on works by Pushkin, Gogol, Chernyshevsky, Dostoevsky, Tolstoy, and Bely. This course is not a regular offering and may not be repeated in the foreseeable future.
Fall semester 1985. Krugovoy.

50R. Russian Literature and Revolutionary Thought.

A study of continuity and change in the relationship between the major political and social movements and the writers before and after 1917. Special attention will be given to the post-revolutionary literary and political struggle in the 1920's and its revival of the 1960's.
Not offered 1985-86. Bradley.

50S. Spanish Thought and Literature of the Twentieth Century.

The struggle between traditionalism and liberalism, its background and manifestations in Spanish thought and letters from the turn of the century through the Civil War to the present day. Emphasis on Unamuno, Ortega y Gasset, Federico Garcia Lorca, Camilo Jose Cela, Carmen Laforet, and Juan Goytisolo.
Not offered 1985-86.

SAL 50. Contemporary Spanish-American Literature.

A consideration of intellectual and social themes and artistic innovations which mark the coming into the mainstream of Spanish-American fiction. Representative authors from the various national literatures. ARGENTINA: Borges, Cortazar; PERU: Vargas Llosa; COLOMBIA: García Márquez; GUATMALA: Asturias; MEXICO: Fuentes, Rulfo, Pedro; CUBA: Carpentier.
Not offered 1985-86.

SAL 60. Spanish American Society Through Its Novel.

This course will explore the relationship between society and the novel in Spanish America. Selected works by Carlos Fuentes, Mario Vargas Llosa, Gabriel Garcia Marquez, Juan Rulfo and others will be discussed in conjunction with sociological patterns in contemporary Spanish America. See Sociology-Anthropology 60.
Not offered 1985-86.

70. *Renaissance Comparative Literature.

See English Literature 70.
Not offered 1985-86.

71. European Romanticism.

(See English Literature 71.)
Not offered 1985-86.

74a. Modern Drama I: Ibsen to Avant Garde.

(See English Literature 74a.)
Spring semester 1986. Williamson.

74b. Modern Drama II: Avant Garde and Contemporary.

(See English Literature 74b.)
Not offered 1985-86. Leff.

79. Studies in Comparative Fiction.

(See English Literature 79)
(To be taught in alternate years by Mod. Languages.)
Spring semester 1986. Weinstein.
Spring semester 1986.

EXPLANATORY NOTE OF FIRST- AND SECOND-YEAR LANGUAGE COURSES:

A. Courses numbered 1-2 are designed for students who begin their study of the language in college and whose primary interest is the acquisition of reading skills:

   1-2 combines the presentation of grammar with readings from the humanities (including literature), social sciences, and sciences. Classes meet three times per week and are conducted in English. May be used to prepare for fulfilling the reading requirement of graduate schools but does not prepare students for intermediate or advanced courses in literature taught in the original language.
   Students who start in the 1-2 sequence must complete 2 in order to receive credit for 1. However, students placing directly in 2 can receive credit for a single semester of language work.

B. Courses numbered 1B-2B, 3B, 4B, 5B carry one and one-half credits per semester.

Three semesters in this sequence are equivalent to two years of work at the college level. Designed to impart an active command of the language and combine the study or review of grammar essentials and readings of varied texts with intensive practice to develop the ability to speak the language. Recommended for students who want to progress rapidly and especially for those with no previous knowledge of the language and who are interested in preparing for intermediate or advanced courses in literature taught in the original language. Students who start in this orientation can major in a foreign language and literature not studied previously. These courses (a) meet as one section for grammar presentation and in small groups for oral practice with a native speaker of the language, and (b) may require periodic work in the language laboratory.

Students who start in the 1B-2B sequence must complete 2B in order to receive credit for 1B. However, students placing directly in 2B can receive one and one-half semester credits. Courses numbered 3B and 4B may be taken singly for one and one-half semester credits.

Chinese

The purpose of the program is to develop competence in the modern Chinese language. Students should plan to take the introductory and intermediate courses as early as possible so that studying in China may, if desired, be incorporated into their curriculum. The courses numbered 1B-2B, 3B, 4B, 11 are offered each year and 12, 15 in alternate springs.

A Chinese Studies Major is being considered. Upon approval, the major will have as its requirement Third-Year Chinese, Chinese 12, History 9, five other courses from such departments as Linguistics, History, History of Art, Music, Political Science, and Religion, and a thesis or a comprehensive examination.

Although no major exists currently in Chinese in either the course program or the External Examination program, qualified students are urged to consider the possibility of a Special Major in combination with the departments mentioned above. It is possible to prepare for one External Examination in the field of Classical Chinese Literature. Interested students should consult with the Section Head in Chinese.

COURSES

1B-2B. Introduction to Mandarin Chinese.

An intensive introduction to spoken and written Mandarin Chinese, with emphasis on oral practice. Designed to impart an active command of basic grammar. Introduces 350 to 400 characters and develops the ability to read and write in simple modern Chinese.
Luk and Chang.

3B, 4B. Second-year Mandarin Chinese.

Designed for students who have mastered basic grammar and 350 to 400 characters. Combines intensive oral practice with writing and reading in the modern language. Emphasis is on rapid expansion of vocabulary, idiomatic expressions, and thorough understanding of grammatical patterns. Prepares students for advanced study at the College and in China.
Luk and Chang.

11. Third-year Chinese.

Concentrates on reading in modern Chinese. Develops the ability to read a variety of Modern Chinese writings, fiction, essays, documentary and journalistic materials and the ability to write in the modern language. Classes conducted in Chinese, though oral translation into English is an important component.
Luk.

12. Chinese Literature in Translation.

An introduction to Chinese literature, its themes and the intellectual tradition it reflects. Course material includes fiction, drama, and a brief consideration of classical poetry.
Spring semester 1987. Luk.

15. The Chinese Language.

A linguistic survey of the history and structure of the Chinese language; Chinese as a non-

Indo-European language, its basic structure, its dialects and national standard, and the development of its writing system.
Spring semester 1986. Luk.

93. Directed Reading.

French

French may be offered as a major in the Course Program or as a major or minor in the External Examination (Honors) Program. Prerequisites for both Course students and Honors candidates are as follows: French 12 and 16, the equivalent, or evidence of special competence.

Recommended supporting subjects: see the introductory departmental statement.

All majors including students preparing a Secondary School certificate are strongly urged to spend at least one semester of study in France.

Majors in the Course and Honors Programs, as well as minors in the Honors Program, are expected to be sufficiently proficient in spoken and written French to do all of their work in French, i.e., discussions and papers in courses and seminars, and all oral and written examinations, including comprehensive and Honors examinations.

Course majors are required to do Special Topics and to complete a comprehensive examination in the Spring semester of their senior year. This examination is based on a reading list of essential works from the Middle Ages to the Twentieth Century. Students may choose to prepare any two consecutive centuries, plus one genre in any of two other centuries, and they are expected to devise a suitable program of study on this basis in the Fall semester of the junior year.

Students are required to take at least one course in Literature before 1800. They can take no more than two courses of a non-literary nature.

COURSES

NOTE: Not all advanced courses are offered every year. Students wishing to major or minor in French should plan their program in consultation with the Department.

1B-2B, 3B. Intensive French.
For students who begin French in college. Designed to impart an active command of the language. Combines the study of grammar with intensive oral practice, writing, and readings in literary or expository prose. Prepares for intermediate and advanced courses in language or literature taught exclusively in French. Recommended for students who wish to acquire minimal linguistic competence for study abroad in the Swarthmore Program in France. See the explanatory note on language courses above as well as the description of the Swarthmore program at the University of Grenoble under *Education Abroad.*

5. Composition and Diction.
This course satisfies the prerequisites for intermediate and advanced courses taught in the original language, such as 12 or 16. Emphasis is on the consolidation of grammatical principles with an aim to increasing the facility to write and speak the language through work with formal grammar, selected readings of literary or general interest, newspaper and magazine articles, radio programs, films, etc. Recommended for students who wish to study abroad at the university level.
Prerequisite: French 3B or the equivalent.
Each semester.

5A. French Conversation.
A half-credit conversation course concentrating on the development of the students' ability to speak French.
Each semester. Trabut.

10. Images de la France.
Salient aspects of French civilization in the age-long struggle for human values. May include literary works depicting life or events in a given period but emphasis is on social, political, and artistic highlights rather than belles lettres as such. Readings and discussions in French.
Prerequisite: French 5 or equivalent.
Fall semester 1985. Tafoya.

12. Introduction to Literary Studies.
An analytical approach to French literature through the study of particular genres or specific modes of expression. Selected works from Molière to Beckett.
Prerequisite: French 5, a score of 675 on the College Entrance Examination, or the equivalent with special permission.
Each semester.

15. Freshmen Seminar.
For freshmen only. Limited enrollment.
Prerequisite: a score of 675 or above in French, and satisfactory performance in the Placement Exam for Literature courses administered during Freshman Orientation.
Topic for 1985: La Satire.
Fall semester. Perkins.

16. Studies in Stylistics.
For majors or those who wish an advanced course to develop self-expression in the written and oral language. Original compositions are based on a stylistic study of texts by representative French authors from the 17th century to the present.
Prerequisite: French 5, 12, or the equivalent with special permission.
Each semester.

20. History of the French Language.
The development of the French language from its Latin origins to its current forms. Emphasis will be placed more on general patterns than on philological details. Texts of the various periods will be analyzed intensively. The course will be given in English; students must have a reading knowledge of French. This course will satisfy the linguistics requirement for a teacher certification and may be used for a Medieval Studies major.
Fall semester 1985. Perkins.

22. Le Cinéma francais.
An examination of the evolution of style and theme in French Cinema from Realism to Nouvelle Vague. Among directors studied will be Clair, Renior, and Carné, as well as Resnais, Truffaut, and Godard.
Roza.

25. L'Ancien Régime.
This course will study the social conditions of 17th and 18th century France in both rural and urban areas (i.e., peasants, artisans, merchants, nobles, etc.). Readings will be taken from 20th century historians (i.e., Goubert, Ariès, Flandrin, etc.) and from representative literary texts of the period (i.e., Saint-Simon, Lesage, Diderot, etc.)
Prerequisite: French 12 or equivalent language skills.
Perkins.

28. La France Contemporaine.
A study of events and ideas which have shaped French society from the 19th century to the present. Selected French works in history, political science, sociology and literature.
Smith.

30. Littérature du Moyen-Age.

33. Femmes écrivains.
Women writers from the Middle Ages to the beginning of the XXth century.
Spring semeter 1986. Smith.

35. L'Humanisme de la Renaissance.

42. Litterature du 17e Siècle.

43. Le Théâtre.
Representative works from the Middle Ages to the the Romantic period included.
Smith.

50. Le Roman avant la Révolution.

51. Les Philosophes.

60. Le Roman du 19e Siècle.
A study of innovations in techniques and form as well as the examination of moral problems arising from soci-political changes in 19th century France. Based primarily on the novels of Balzac, Stendhal, Flaubert, and Zola.
Moskos.

61. Romantisme.

65. Baudelaire, Rimbaud, Mallarmé, Apollinaire.
Fall semester 1986. Roza.

70. Théâtre Moderne.
Major trends in 20th century drama from Anouih, Sartre to Beckett and Ionesco.
Roza.

71. Poésie Contemporaine.
From Apollinaire and Surrealism to Char and Saint John-Perse.
Roza.

72. Le Roman du 20e Siècle.

An examination of the tensions between humanistic tradition and formal innovation in the French Novel from Proust and Gide to the Nouveau Roman and beyond.
Fall semester 1985. Roza.

73. Littérateurs Engagés.
A study of the literature of commitment before and after World War II. Principally an examination of the literary manifestations of French Existentialism. Includes works by Malraux, Satre, de Beauvoir, Camus, or others.
Tafoya.
Spring semester 1987. Tafoya.

75. Proust and Joyce.

76. Ecriture féminine.
A study of the literary, theoretical and sociopolitical implications of feminine texts in twentieth-century France. Topics to be discussed: the idea of the author, deconstruction and feminism, psychoanalysis and women, and others.
Fall semester 1986. Moskos.

91. Special Topics.
Study of individual authors, selected themes, or critical problems.
Spring semester 1986.

92. Colloquium.

93. Directed Reading.

94. Thesis.

SEMINARS

Preparation of topics for External Examinations (Honors) may be done by appropriate courses plus attachments only when seminars are not available. Students preparing for External Examinations should consult with the Department on the suitability and availability of attachments.

100. Littérature du Moyen-Age.
Old French readings in lyric poetry, theatre and romance.
Perkins.

101. La Renaissance.
Prose works of Rabelais, Marguerite de Navarre, and Montaigne. Poetic innovations from Marot through the Pleiade.
Smith.

102. Le Théâtre Classique.
1. Aristotle, Corneille, and Racine: a study of "the Tragic" and the theories of tragedy. 2. Moliere.
Spring semester 1987. Smith.

103. L'Age des Lumières.
Concentrating on Diderot and Rousseau.
Perkins.

104. Stendhal et Flaubert.
Spring semester 1986. Moskos.

105. Proust.
Style and vision in *La Recherche du Temps perdu.*
Fall semester 1985. Roza.

106. Poésie Symboliste.
From Baudelaire to Apollinaire.
Roza.

108. Le Roman du 20e Siècle.
Major innovations in form and theme from Gide and Proust to the New Novel.
Roza.

109. Le Romantisme.
Fall semester 1986. Moskos

180. Thesis.

German

German may be offered as a major in the Course Program or as a major or minor in the External Examination (Honors) Program. Prerequisites for both Course students and Honors candidates are as follows:

Required: German 11 or 12, or equivalent work.

Recommended supporting subjects: see the introductory departmental statement.

With minor exceptions, the language of instruction in courses numbered 11 and above is German. Students are expected to have a sufficient command of the language to be able to participate in class discussions and do written work in German. Course majors are required to do Special Topics.

COURSES

NOTE: Not all advanced courses or seminars are offered every year. Students wishing to major or minor in German should plan their program in consultation with the Department.

All courses listed under Groups I and II are open to students after either German 11 or 12. The courses listed under Group II are offered on a regular two-year sequence. Majors in Course are required to select a minimum of four courses from Group II.

1-2. German Reading and Translation.

For students who wish to acquire the fundamentals of German grammar and a reading knowledge of the language. This two-semester course is a terminal sequence. See the explanatory note on language courses above.
Staff.

1B-2B, 3B. Intensive German.

For students who begin German in college. Designed to impart an active command of the language. Combines the study of grammar with intensive oral practice, writing, and readings in literary or expository prose. See the explanatory note on language courses above. Normally followed by 8, 11 or 12.
1B-2B. Plaxton and staff.
3B. *Fall semester.* Faber and Plaxton.

8. Writing and Speaking German.

Oral discussions and writing practice based on general and literary topics of contemporary interest. For students who want to consolidate their skills of expression. Recommended for German majors. Can be taken concurrently with German 11 or 12.
Prerequisite: German 3B or by departmental placement test.
Each semester. Shafi.

GROUP I

11. Introduction to German Literature (early 20th century).

An introductory course which emphasizes critical and analytical reading of literature. Representative poetry, drama, and fiction from the beginning of the 20th century, including works by Rilke, Schnitzler, Kafka, Mann and Brecht.
Prerequisite: German 3B, 8 or equivalent work.
Spring semester. Shafi.

12. Introduction to German Literature (The Age of Goethe).

An introduction to German literature through close reading of selections from the second half of the 18th and the early part of the 19th century. Authors include Lessing, Goethe, Schiller, and the Romantics.
Fall semester. Faber.

13. Translation: Theory and Practice.

This course aims at exploring the act of translation, at first theoretically, and subsequently—and primarily—through practice in translating texts from various fields within the humanities from German into English. In the second half of the course, students will pursue individual projects in consultation with the instructor. This course does not count towards the major.
Prerequisite: German 2, 3B, or the equivalent.
Not offered 1985-86.

50. Die Deutsche Lyrik.

Readings in the major German poets.
Fall semester. Faber.

63. Goethe's Faust.

An intensive study of *Faust I* and *II*.
To be offered 1986-87.

83. Kafka and Brecht.

A study of the principal works of each author with emphasis on the emergence of major themes and the examinations of literary craftsmanship. Kafka's notebooks and journals and Brecht's journals and critical writings will be considered in the context of the authors' cultural and social environment.
Not offered 1985-86.

91. Special Topics (for senior majors).

Study of individual authors, selected themes, or critical problems.

GROUP II

52. Das Deutsche Drama.
A study of German drama, concentrating on the modern period and including also an examination of opera as drama. Readings include plays by Brecht, Büchner, Hauptmann, Kaiser, Schiller, and Wedekind as well as the libretti to the following operas: Mozart's *Die Zauberflöte*, Wagner's *Tristan und Isolde*, and Berg's *Wozzek*.
Not offered 1985-86.

60. Aufklaerung und Sturm und Drang.
The German Enlightenment and various reactions to it. Authors read include Gellert, Lessing, Klopstock, Wieland, Herder, the early Goethe, and the early Schiller.
Not offered 1985-86. Weber.

72. Literatur des neunzehnten Jahrhunderts.
Representative prose fiction, drama, and lyric poetry from the end of Romanticism through the beginnings of Modernism. Readings include selections from essayistic writings reflecting contemporary thought.
Not offered 1985-86.

80. Klassiker der Moderne.
A study of German literature from the beginnings of Modernism through World War I. Authors include Hofmannsthal, Rilke, George, Schnitzler, Trakl, Sternheim, and Thomas Mann.
Not offered 1985-86. Avery.

82. Literatur des zwanzigsten Jahrhunderts.
German literature from the twenties to the present with emphasis on the continuity of the modern tradition under the impact of political exile and World War II. Authors include Brecht, Thomas Mann, and post-World War II writing in Austria, Switzerland, East and West Germany.
Not offered 1985-86. Avery.

Courses to be offered in subsequent years:

84. Rilke, Hofmannsthal, George.

SEMINARS

All seminars to be offered in a particular year will be announced in advance. Preparation of topics for External Examinations (Honors) may be done by appropriate courses plus attachments only when seminars are not available. Students preparing for External Examinations should consult with the Department on the suitability and availability of attachments.

104. Goethe.
A study of Goethe's major works in the context of his life and times.
(This seminar does not include *Faust*.)
Spring semester 1986. Weber.

105. Die Deutsche Romantik.
Romanticism as the dominant movement in German literature, thought, and the arts in the first third of the 19th century. Authors include Tieck, Novalis, Holderlin, Kleist, Brentano, Eichendorff, the early Buchner, and Heine. Also offered as a course. See 70.
To be offered 1986-87. Faber.

107. Moderne Prosa.
The development of German prose narrative since 1900 as reflected in works by Schnitzler, Hofmannsthal, Rilke, Mann, Kafka, Döblin, Karl Kraus, and R. Walser.
To be offered 1986-87. Avery.

108. Deutsche Literatur nach 1950.
The emergence of distinctive works of narrative fiction, lyric poetry, and drama in the two Germanies, in Austria and in Switzerland following the collapse of Nationalist Socialism in Germany. Emphasis on works by major authors.
Fall semester. Shafi.

Russian

Russian may be offered as a major in the Course Program or as a major or minor in the

External Examination (Honors) Program. Prerequisites for both Course students and Honors candidates are: Russian 6, 11, 12, and 13, or equivalent work.
Recommended supporting subjects: see the introductory department statement.

COURSES

NOTE: Not all advanced courses or seminars are offered every year. Students wishing to major or minor in Russian should plan their program in consultation with the Department. Course majors are required to do Special Topics.

1-2. Russian Reading and Translation.
For students who wish to acquire the fundamentals of Russian grammar and a reading knowledge of the language. This course is designed especially for those students in the Social and Natural Sciences who seek to read and translate scholarly, scientific materials in the original.
Not offered 1985-86.

1B-2B, 3B. Intensive Russian.
For students who begin Russian in college. Designed to impart an active command of the language. Combines the study of grammar with intensive oral practice, writing, and readings in literary or expository prose. See the explanatory note on language courses above. Normally followed by 6, 11, and 12.

6. Advanced Russian.
For majors and those primarily interested in perfecting their command of language. Advanced conversation, composition, translation, and stylistics. Readings include short stories and newspapers. Conducted in Russian.
Spring semester. Krugovoy.

11. Introduction to Russian Literature.
Old Russian literature and its place within European literature. 18th century: Classicism and Sentimentalism. 19th century: Romanticism and Golden Age of Russian poetry. Pushkin, Lermontov, Gogol. Lectures and discussions in Russian.
Fall semester. Krugovoy.

12. Introduction to Russian Literature.
19th and 20th century Russian literature to 1918, and its place within European literature. Realism and literary tendencies in the first two decades of the 20th century. Turgenev, Dostoevsky, Tolstoy, Chekhov, Bunin, Bely. Silver Age of Russian poetry. Lectures and discussions in Russian.
Spring semester. Krugovoy.

13. The Russian Novel.
Continuity and change in the development of the novel in the 19th century and in the post-revolutionary period. Lectures and readings in English. Russian majors will be required to read a part of the material in Russian.
Fall semester. Bradley.

16. History of the Russian Language.
An introductory course. A study of the origin of the Russian language and its place among the other modern Indo-European and Slavic languages. The uses of philology and linguistics for the ideological and stylistic analysis of literary texts.
Satisfies the linguistics requirement for teacher certification.
Not offered 1985-86.

91. Special Topics.
(For senior majors.) Study of individual authors, selected themes or critical problems.

93. Directed Reading.

SEMINARS

101. Tolstoy.

102. Russian Short Story.

103. Pushkin and Lermontov.

104. Dostoevsky.

105. Literature of the Soviet Period.
Spring semester 1986. Bradley.

106. Russian Drama.

107. Russian Lyrical Poetry.

108. Modern Russian Poetry.

109. Chekhov.

110. Bulkakov.
Fall semester 1985. Krugovoy.

Spanish

Spanish may be offered as a major in the Course Program but not as a major in the External Examination (Honors) Program. Prerequisites for Course students are as follows:

Required: Spanish 11, 13, 41 or equivalent work.

Recommended supporting subjects: see the introductory departmental statement.

Majors are expected to speak Spanish with sufficient fluency to take part in discussion in the language and to pass all oral comprehensive examinations in Spanish. Course majors are required to do Special Topics.

COURSES

NOTE: Not all advanced courses are offered every year. Students wishing to major in Spanish should plan their program in consultation with the Department.

1B-2B, 3B. Intensive Spanish.

For students who begin Spanish in college. Designed to impart an active command of the language. Combines the study of grammar with intensive oral practice, writing, and readings in literary or expository prose. See the explanatory note on language courses above. Normally followed by 5B, 11 or 13.

5B. Intensive Spanish.

For majors and others who wish an advanced language course in which the emphasis is not primarily literary. Much attention paid to pronunciation, writing skills, speaking, and the most difficult concepts of Spanish grammar. An ideal course prior to study abroad.
Each semester. Hassett and Kenney.

7. Fonética Española y Composición.

A course designed to improve the individual student's pronunciation of Spanish and composition. Highly recommended for majors and other advanced students.
Spring semester, 1986. Metzidakis.

11. Introduction to Spanish Literature.

A study of representative prose fiction, poetry, and drama of the 19th and 20th centuries (works by authors such as Espronceda, Zorrilla, Becquer, Perez Galdós, Unamuno, Baroja, Lorca, etc.). Discussions, papers.
Prerequisite: Spanish 3B, the equivalent, or special permission.
Fall semester. Metzidakis.

13. Introduction to Spanish American Literature.

A study of representative prose fiction, poetry, and drama of the 19th and 20th centuries (works by Echeverria, Sarmiento, Marti, Silva, Darío, Lugones, Sánchez, Lillo, Neruda, Vallejo, Huidobro, Rulfo, Garcia Márquez, Borges, Valenzuela and others). Discussions, papers.
Spring semester. Hassett.

NOTE: Spanish 11, 13, the equivalent, or consent of instructor, are prerequisite for the courses in literature that follow.

41. Obras maestras de la Edad Media y del Renacimiento.

Early masterpieces of Spanish literature from the 11th to the 16th century, from the epic (el *Cantar del Mio Cid*) through the Mystics (San Juan de la Cruz).
Fall semeter 1986. Metzidakis.

44. Cervantes.

The works of Cervantes with special emphasis on the Quijote.
Spring semeter 1987. Metzidakis.

46. La novela picaresca.

A study of the major picaresque novels from both Spanish and Spanish American literature. Works by Cervantes, Quevedo, Baroja, Fernandez de Lizardi, Romero and others. Comparative work will also be done on Fielding, Mann, Twain, etc.
Fall semester 1985. Metzidakis.

48. El Regionalismo Español

This course will examine how the different regions of Spain are captured and interpreted by their principal regional commentators. Texts will include works by deCastro, Baroja, Azorin, Machado, Galdós.
Spring semester 1986. Metzidakis.

72. La Novele Española de Postguerra.

This course will examine the fiction of the postwar novel in Spain. Major figures will include Cela, Sánchez Ferlosio, Delibes, Martín Santos, Goytisolo and others.
Spring semester 1987. Metzidakis.

76. La Poesía Hispanoamericana del Siglo XX.
Texts will include the poetry of Gabriela Mistral, Delmira Agustini, Alfonsina Storni, César Vallejo, Pablo Neruda, Octavio Paz and others.
Fall semester 1985. Staff.

77. La Novela Hispanoamericana del Siglo XX.
Novels by Juan Rulfo, Maria Luisa Bombal, Jóse Donoso, Carlos Fuentes, Mario Vargas Llosa, Gabriel Garcia Márquez, Manuel Puig, Luisa Valenzuela.
Fall Semester 1986. Hassett.

79. El Cuento Hispanoamericano.
The Spanish American short story from the early 19th century to the present. Representative authors include Echevarria, Carrasquilla, Payro, Lillo, Roa Bastos, Borges, Bioy Basares, Rulfo, Cortázar, García, Márquez, Valenzuela, Skármeta and others.
Spring semester 1986. Hassett.

91. Special Topics.
Study of individual authors, selected themes, or critical problems. Topic for Spring 1987: "The Fiction of Peruvian author Mario Vargas Llosa." Open to all students with prior experience in Spanish and/or Spanish American Literature.
Spring semester 1987. Hassett.

Courses to be offered in subsequent years:

30. La Literatura Medieval.

40. El Teatro del Renacimiento y del Siglo de Oro.

42. La Poesía del Renacimiento y del Siglo de Oro.

60. La Novela en el Siglo XIX.

70. La Generacion del 98.

71. Literature Española Contemporánea.

72. La Novela Española de la Posguerra.

73. Unamuno.

74. Literatura Española de Posguerra.

75. Teatro Hispanoamericano Contemporáneo.

78. La Novela Mexicana Social del Siglo XX.

EXTERNAL EXAMINATION (HONORS) PROGRAM

Although the Spanish section can not now prepare students for External Examinations, students interested in such a possibility should make their wishes known to the section.

Music

JAMES D. FREEMAN, Professor and Chairman
PETER GRAM SWING, Professor
SHARON FRIEDLER, Associate Professor of Dance
GERALD LEVINSON, Associate Professor
ANN KOSAKOWSKI McNAMEE, Assistant Professor
PAULA SEPINUCK, Associate in Performance (Dance)
DOROTHY K. FREEMAN, Associate in Performance (Music)
KAREN MEYERS, Associate in Performance (Music)
GEOFFREY MICHAELS, Associate in Performance (Music)
CAROLYN REICHEK, Associate in Performance (Dance)
ROBERT M. SMART, Associate in Performance (Music)
NANCEY ROSENSWEIG, Associate in Performance (Dance)

The study of music as a liberal art requires an integrated approach to theory, history, and performance, experience in all three fields being essential to the understanding of music as an artistic and intellectual achievement. Theory courses train the student to work with musical material, to understand modes of organization in composition and to evolve methods of musical analysis. History courses introduce students to methods of studying the development of musical styles and genres, and the relationship of music to other arts and areas of thought. The Department encourages students to develop performing skills through private study and through participation in the band, chorus, early music ensemble, orchestra, and chamber music coaching program which it staffs and administers. The Department also assists instrumentalists or singers to finance the cost of private instruction. Credit may be granted under the provisions for Creative Arts.

Students wishing to combine instrumental or vocal studies outside the College with a major in music at Swarthmore can, with special permission, from the department and the Provost, elect a five-year plan of study, thus reducing the normal number of courses to be taken per semester.

Two semester courses in theory and one semester course in history are prerequisite for acceptance as a major. Majors will normally take five semester courses in theory (including Music 15, 16, or 17), three semester courses in history (including Music 20 and either 21 or 22) and meet the basic piano requirement. Majors are expected to participate in at least one of the department's performing organizations.

Major in the External Examination (Honors) Program: A student intending to major in the Honors Program will normally stand for four papers in music. The Department strongly recommends that one paper be a thesis or research project. Any Theory/Composition course numbered 15 or higher, also all history courses, can be used as the basis of a paper when augmented by a concurrent or subsequent attached unit of additional research, or by directed reading, or by a tutorial.

Minors in the Honors Program: A student intending to minor in the Honors Program will normally stand for two papers in music. Two semester courses in theory and one semester course in history are prerequisite for a minor. Music 2 may, with permission of the Department, be substituted for the theory prerequisite.

Language Requirements for Graduate Schools: Students are advised that graduate work in music requires a reading knowledge of French and German. A reading knowledge of Latin is also desirable for students planning to do graduate work in musicology.

Proficiency on an instrument: All majors in music will be expected to play a keyboard instrument well enough by their senior year to perform at sight a two-part invention of J. S. Bach and a first movement of an easy late 18th or early 19th century sonata. By the end of the junior year they should be able to read chamber music scores, vocal music in four clefs, and realize

figured basses. The department recommends that majors take one or two semesters of Music 42 to develop these skills. Students with exceptional proficiency in an instrument other than the piano, or in singing, will not be expected to meet the performing standards of pianists.

The basic piano program: This program is designed to develop keyboard proficiency to a point where a student can effectively use the piano as a tool for study, also to help students meet the keyboard requirements outlined above. It is open to freshmen and sophomores planning to major in music. No academic credit is given for basic piano.

Special scholarships and awards in music include:

The Elizabeth Pollard Fetter String Quartet Scholarships: See p. 63.

Friends of Music and Dance Summer Fellowships: See p. 63.

The Melvin B. Troy Award: See p. 62.

The Boyd and Ruth Barnard Fund Grants: See p. 23.

The Barclay and Edith Lewis White Scholarship: See p. 30.

The Barnard Fellows: See p. 13.

The Peter Gram Swing Prize: See p. 62.

CREDIT FOR PERFORMANCE

Chamber Music, Chorus, Orchestra, Early Music Ensemble, Wind Ensemble

Students may take Performance Chorus (Music 43), Performance Orchestra (Music 44), Performance Early Music Ensemble (Music 45), Performance Wind Ensemble (Music 46), or Performance Chamber Music (Music 47), for credit with the permission of the Department member who has the responsibility for that performing group. The amount of credit received will be a half-course in any one semester and usually will be granted only to students participating for a full year in a particular activity. Students applying for credit will fulfill requirements established for each activity, i.e., regular attendance at rehearsals and performances and participation in any supplementary classes held in connection with the activity. Students will be graded on a credit/no credit basis.

Individual Instruction (Music 48)

Music Majors and members of the Wind Ensemble, Chorus, Early Music Ensemble, Gospel Choir, and Orchestra may, if they wish, take lessons for credit. Members of the Chorus, Early Music Ensemble, and Gospel Choir are eligible for voice lessons; members of the Wind Ensemble, Early Music Ensemble, and Orchestra are eligible for lessons on their primary instrument. Students who are not Music Majors and are not in any of the performing organizations listed above may take lessons for credit if they are concurrently enrolled in a History or Theory/Composition course offered by the Music Department. Pianists who are not Music Majors and who are not enrolled in a History or Theory/Composition course offered by the Department may qualify for Music 48 by taking part in the Department's Program for Accompanists. The Department expects such pianists to give at least three hours a week to the Program.

A student applying for Individual Instruction will first demonstrate to the Department ability to undertake such study at least at an intermediate level. The student will arrange to work with a teacher of her/his choice, subject to the approval of the Department, which will then supervise the course of study and grade it on a credit/no credit basis. Teacher and student will submit written evaluations, and the student will perform for a jury at the end of the semester. The Department will then decide if the student should receive credit, and if the student can re-enroll.

The Department will pay one-quarter the cost of eight lessons for all students enrolled, except that Music Majors and section leaders in the Chorus and Orchestra will receive two-thirds the cost of eight lessons, up to a maximum of $133 per semester.

All students enrolled in Music 48 are strongly encouraged to perform in student chamber music concerts and to try out for concertos with the Orchestra and solos with the Chorus.

Music

COURSES AND SEMINARS

1. Introduction to Music.
A course designed to teach intelligent listening. The course assumes no prior training in music.
Open to all students without prerequisite.
Spring semester. Swing.

2. Introduction to Music.
A course that approaches listening and analysis through concentration on musical fundamentals: reading notation and developing or expanding aural perception of pitch, rhythm, structure, phrasing, and instrumentation. The course assumes no prior training in music.
Open to all students without prerequisite.
Fall semester. J. Freeman.

6. J. S. Bach.
An introduction to his career as composer and performer through readings and through study of his compositions in representative genres. The course emphasizes training in informed listening.
Open to all students without prerequisite.
Fall semester. Swing.

8. Music of the Orient.
Introduction to music and musical theories of the Near East and Far East. Guest lecturers in special fields will meet with the class at appropriate intervals.
Open to all students without prerequisite.
Not offered 1985-86.

10. American Music.
A study of unwritten and written music in the United States to 1940, popular and vernacular as well as classical, using Charles Hamm, *Music in the New World*, as a text. Students will be evaluated on a portfolio of work to include papers presented in class, reports on music listened to, listening quizzes, and an extended essay on a topic of choice.
No prerequisite. Enrollment limited to 12.
Not offered 1985-86.

THEORY AND COMPOSITION

Students who anticipate taking further courses in the Department or majoring in Music are urged to take Music 11-12 as early as possible. Placement exams are given each year at the first meeting of that course for students who feel they may be able to place out of it. Majors will normally take Music 11-12, 13-14, and 15, 16, or 17 in successive years.

11-12. Harmony and Counterpoint I.
Written musical exercises include composition of original materials as well as commentary on excerpts from the tonal literature. Listening assignments coordinated with written work.
Prerequisite: knowledge of traditional notation, major/minor scales, ability to play or sing at sight simple lines in treble and bass clef.
Year course. McNamee.

13-14. Harmony and Counterpoint II.
Continued work with tonal harmony and counterpoint at an intermedite level. Detailed study of selected works with assignment derived from these works, as well as original compositions.
Prerequisite: Music 11-12 (or the equivalent).
Year course. Levinson.

15. Harmony and Counterpoint III.
Detailed study of a limited number of works both tonal and non-tonal, with independent work encouraged.
Prerequisite: Music 13-14 (or equivalent).
Not offered 1985-86.

16. Schenker.
An introduction to Schenkerian analysis. An extension of traditional analytical techniques, incorporating Schenker's principles of voice leading, counterpoint, and harmony.
Prerequisite: Music 13-14 (or equivalent).
Spring semester. McNamee.

17. History of Music Theory.
A survey of primary sources (in translation) from Boethius, Tinctoris, and Zarlino through Rameau, Riemann, and Schoenberg.
Prerequisite: Music 11-12 (or equivalent).
Not offered 1985-86.

19. Composition.
Both semesters. Levinson.

20. Medieval and Renaissance Music.

The study of medieval and renaissance music beginning with Gregorian chant and ending with the music of Josquin Desprez. The course is also concerned with the relationship of music to the art and thought of the times, and the function of music in the Roman Catholic liturgy.

Prerequisite: a knowledge of traditional notation.

Fall semester. Swing.

21. Baroque and Classical Music.

Topics in music of the 17th and 18th centuries. This course, run as a seminar, deals with music by Purcell, Handel, and Haydn as performed in the city of London, along with the political and social conditions governing commissions and performances.

Not offered 1985-86.

22. Nineteenth-Century Music.

Beethoven through Wagner, Brahms, and Mahler. A study of Romanticism in music, stylistic characteristics and historical premises.

Prerequisite: a knowledge of traditional notation.

Spring semester. Freeman.

23. Twentieth-Century Music.

A study of the various stylistic directions in music of the 20th Century. Representative works by composers from Debussy, Stravinsky, and Schoenberg, through Copland, Messiaen, and others, to post-war composers such as Boulez and Crumb will be examined in detail.

Prerequisite: a knowledge of traditional notation.

Fall semester. Levinson.

30. W. A. Mozart.

A study of representative works in the light of modern style criticism. A reading knowledge of French or German is desirable.

Prerequisite: a knowledge of traditional notation.

Not offered 1985-86.

31. Opera.

A study of opera and drama, concentrating on ideas of operatic "reform" and on specific works by Monteverdi, Purcell, Mozart, Verdi, Wagner, Tschaikowsky, Puccini, Berg, Menotti, and Stravinsky. Projects will include preparation and performance of selected ensembles for those with vocal or dramatic experience and papers for those with little or no performing experience.

Prerequisite: a knowledge of traditional notation.

Not offered 1985-86.

32. History of the String Quartet.

This course traces the development of the string quartet from the middle of the 18th century to the present through study and (wherever possible) performance of selected works.

Open to students with permission of the instructor.

Spring semester. Swing.

33. Lieder.

A study, through performance and analysis, of various solutions by various composers to the problems of relating text and music. Students should be moderately proficient either as singers or as pianists. A knowledge of German is desirable.

Fall semester. J. Freeman.

38. Women Composers and Choreographers of the Early Twentieth Century.

A survey of early twentieth-century women composers and teachers, as well as a study of several of the most influential choreographers of modern dance. Choreographers include Duncan and Graham; musicians include Boulanger, Crawford-Seeger, and Landowska.

Open to all students without prerequisite.

Half-course credit.

Fall semester. McNamee and Sepinuck.

39. Music and Dance: Criticism and Reviewing.

This course, to be administered by the department and taught by guest lecturers who are prominent in the field of reviewing, will cover various aspects of writing about the performance of music and dance: previewing, reviewing, the critic's role and responsibilities, and the special problems of relating performance to the written word.

Not offered 1985-86.

60. Projects in Performance.
A study of chamber repertoire. Performance practice and problems in music of various styles will be examined in terms of analysis, research, and rehearsal. Ability to perform instrumentally or vocally is required.
Not offered 1985-86.

92. Independent Study.

93. Directed Reading.

95. Tutorial.
Special work in composition, theory, or history. One or two credits.

96. Senior Thesis.
One or two credits.
Fall and spring semesters.

PERFORMANCE (MUSIC)

NOTE: All performance courses are for half-course credit per semester. See p. 52 and p. 169 for general provisions governing work in performance under the provisions for Creative Arts.

40. Elements of Musicianship.
Sight-singing, rhythmic and melodic dictation. Open to all students and may be taken with or without credit.
Both semesters. McNamee and Meyers.

41. Conducting.
Fall semester. McNamee.

42. Figured Bass and Score Reading.
Both semesters. Smart.

43. Performance (chorus).
Both semesters. Swing and McNamee.

44. Performance (orchestra).
Both semesters. Freeman and Michaels.

45. Performance (early music ensemble).
Both semesters. Meyers.

46. Performance (wind ensemble).
Both semesters. Levinson.

47. Performance (chamber music).
Both semesters. D. Freeman.

Students taking Music 47 for credit should submit to the Department at the beginning of the semester a repertory of works to be rehearsed, coached, and performed during the semester. They should include the names of all students who have agreed to work on the repertoire, the names of all coaches who have agreed to work with them, and the proposed dates for performance.

A student taking Music 47 for credit will rehearse with her/his group(s) at least two hours every week and will meet with a coach at least every other week. All members of the group should be capable of working well both independently and under the guidance of a coach, also capable of giving a performance of high quality. It is not necessary for every person in the group to be taking Music 47 for credit, but the Department assumes that those taking the course for credit will assume responsibility for the group, making sure that the full group is present for regular rehearsals and coaching sessions.

48. Performance (individual instruction).
(See the guidelines for this course on page 169.)
Both semesters.

49. Keyboard Workshop.
Developing and refining skills in accompanying and sight-reading through work with the chamber, song, and four-hand repertoire.
Spring semester. J. Freeman.

DANCE PROGRAM

Dance, a program within the Department of Music, shares the Department philosophy that courses in theory and history should be integrated with performance. Serious dance

students are urged to supplement their study with appropriate courses in music, theater and other related disciplines.

In a typical semester over twenty hours of dance technique classes are offered on graded levels with a variety of approaches. Technique courses, numbered 1 through 9, receive no academic credit but may be substituted for required physical education. Advanced dancers are encouraged to audition for the performing group, The Swarthmore College Dancers. The group meets three times weekly for class (Dance 40 Performance Dance) and performs several times during the year.

1. Introduction to Dance.

A course in dance technique with emphasis on alignment and movement analysis and includes introductory theory of dance as an art form. The class meets three hours weekly and is a prerequisite (or equivalent prior training) for all dance courses except Dance 23 and 39.
Each semester. Staff.

2. Beginning Ballet.

Prerequisite: Dance 1 (or equivalent prior training). Meets for one hour weekly. It should be supplemented with two hours of dance technique.
Each semester. Staff.

3. Intermediate/Advanced Ballet.

Prerequisite: Dance 2 (or equivalent prior training). Meets for one hour weekly. It should be supplemented with two hours of dance technique.
Each semester. Staff.

4. Intermediate Dance Technique.

Approaches to various styles of dance technique.
Each semester. Staff.

5. High Intermediate Dance Technique.

Meets three hours weekly.
Each semester. Staff.

7. Jazz Dance.

Meets for one class weekly and should be supplemented with two hours of dance technique.
Prerequisite Dance 1 or equivalent.
Not offered 1985-86.

9. Dance Repertory.

Extensive work on performing a piece of choreography.
Spring 1985. Staff.

10. Dance Improvisation.

This course is geared to improvisation both as a performance technique and as a tool for dance composition. It gives the student a chance to expand individual movement vocabulary and work with others as a part of a cohesive ensemble. The class meets three hours weekly and receives one half course credit.
Spring semester. Staff.

11. Dance Composition I.

A study of the principles of dance composition through exploration of the elements of dance movement invention and improvisation, development and movement themes, and choreographic structure. Students will be expected to read, create movement studies, and choreograph a full length dance as a final project. A course in dance technique must be taken concurrently. One credit.
Fall semester. Staff.

11a. Dance Composition.

One half course cedit may be awarded to those students who have previously taken Dance 11 or the equivalent and who choreograph a work which is performed at a public concert. Weekly consultations with the instructor will be required. One-half credit.
Each semester. Staff.

12. Dance Composition II.

A continuation of Dance Composition 1. One-half credit.
Fall semester. Staff.

23. Twentieth Century Dance.

Spring semester. Staff.

38. Women Composers and Choreographers of the Early Twentieth Century.

A survey of early twentieth-century women composers and teachers, as well as a study of several of the most influential choreographers of modern dance. Choreographers include Duncan and Graham; musicians include Boulanger, Crawford-Seeger, and Landowska. Open to all students without prerequisite. Half-course credit.
Fall semester. McNamee and Sepinuck.

39. Music and Dance: Criticism and Reviewing.

(See Music 39).
Not offered 1985-86.

40. Performance (Dance).
This course includes dance technique on the advanced level, basics of production, and performance. Students are required to perform in at least one scheduled dance concert. Admission by audition or invitation of the dance faculty. One-half credit.
Each semester. Staff.

Philosophy

HUGH M. LACEY, Professor
HANS F. OBERDIEK, Professor and Chairman
DOROTHEA FREDE, Associate Professor
CHARLES RAFF, Associate Professor[3]
RICHARD ELDRIDGE, Assistant Professor[3]
EUGENE SCHLOSSBERGER, Visiting Assistant Professor
ELIZABETH ANDERSON, Visiting Instructor

Students majoring in philosophy must complete at least one course or seminar in each of these areas: (1) Logic, (2) Ancient or Modern Philosophy, and (3) Moral or Social Philosophy. Prospective majors should complete the Logic requirement as early as possible. Mastery of at least one foreign language is strongly recommended. Students majoring in the Course Program may be required to elect Philosophy 97.

1. Introduction to Philosophy.

Philosophy addresses fundamental questions that arise in a variety of practices and inquiries. How can we tell whether an action is right, whether an act or institution is just, or whether any of our beliefs are either rationally justifiable or true? Is there a scientific method? Does knowing require having sense-experience? What is human happiness? What is the meaning of a text? Does God exist? Each section of Philosophy 1 concentrates on a few of these and related questions in order to introduce a range of sharply contrasting positions. Readings are typically drawn from the works of both traditional and contemporary thinkers with distinctive, carefully argued and influential views regarding knowledge, morality, mind, and meaning. Socrates, Plato, Aquinas, Descartes, Hobbes, Hume, Mill, and Marx are philosophers frequently considered in various sections. Close attention is paid to formulating questions precisely and to the technique of analyzing arguments. Students are encouraged to develop their own positions through careful consideration of texts and arguments.
Introduction to Philosophy is a prerequisite for all other philosophy courses except Logic.
Each semester. Staff.

2. Freshman Seminar in Philosophy.

Selected philosophical masterpieces discussed in seminar format; that is, seminar papers comprise all written work, discussion in weekly meetings replaces lectures. Texts selected will include works by classical and contemporary authors. This introduction in Philosophy emphasizes development of skills for reading philosophical texts independently.
Not offered 1985-86. Raff.

11. Ethics.

How can we tell whether any action is right or wrong, any trait a virtue or vice, any institution just or unjust? Can one justify any set of action-guiding moral principles? Or is morality relative to one's opinion, culture, or social class? These and related questions will be addressed through an examination of the works of leading moral philosophers, both classical and contemporary. Student papers will address concrete moral issues in biomedicine (e.g., euthanasia, abortion, the allocation of scarce life-saving resources, and experimentation on human subjects) and in public policy (e.g., capital punishment, pacifism and the just war, and political morality).
Fall semester. Oberdiek.

12. Logic.

An introduction to the principles of deductive logic with equal emphasis on the syntactic and semantic aspects of logical systems. Applications of logic to selected philosophical problems are also studied.
Fall semester. Staff.

13. Modern Philosophy.

17th and 18th-century sources of current philosophical problems of knowledge, freedom, humanity, nature, God. Readings from central texts of Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume, Kant.
Spring Semester. Staff.

3 Absent on leave, 1985-86.

14. Ancient Philosophy.
A study of selected work representing the thought of Plato and Aristotle. Emphasis is on understanding and critically evaluating their teachings on fundamental issues of metaphysics, epistemology, psychology, and ethics, as these have shaped our subsequent Western civilization.
Fall semester. Frede.

16. Philosophy of Religion.
See Religion 14.

17. Aesthetics.
How can we tell which things are worth the special sort of attention which we often devote to works of art? What does "art" mean? Do all art works have some property—such as significant form or beauty—in common? Or can anything at all be a work of art? What sorts of things ought we to do with works of art, and what things ought they to do for us? We will attempt to answer these questions by considering views about the nature and function of works of art held by such philosophers as Aristotle, Hume, R. G. Collingwood, Nelson Goodman, and Arthur Danto. Some attention will be paid to twentieth century painting and to the writings of such critics as Clement Greenberg, Harold Rosenberg, and Michael Fried.
Not offered 1985-86. Eldridge.

18. Philosophy of the Social Sciences.
The course will be concerned with the philosophical problems which arise in the attempt to study and understand man. Typical issues will be the relation of facts to values, empirical evidence to theory, and ideas to other cultural forces. An attempt will be made to show how patterns of response to these issues reflect conceptions of the nature of man, and in general bring out the substantive implications of methodology.
Replaced in 1985-86 by Philosophy 89.

19. Medieval Philosophy.
Not offered 1984-85.

21. Social and Political Philosophy.
The course will examine the two main traditions in liberal political philosophy: social contract theory and utilitarianism. Special attention will be paid to the justification of tolerance in these traditions, and to the conceptions of political community associated with them. Readings will include such thinkers as Hobbes, Locke, Bentham, Mill, Rawls and critics of liberalism such as Marx, MacIntyre, and Arendt.
Spring semester. E. Anderson

23. Contemporary Philosophy.
See Philosophy 104.
Spring semester. Schlossberger.

24. Theory of Knowledge.
Empiricist, idealist, and realist traditions in epistemology surveyed as treatments of problems of scepticism, dogmatism, authority, truth, self-knowledge, perception, memory, objectivity. Readings from both current and traditional theorists.
Not offered 1985-86.

26. Philosophy of Language.
In writing and speaking we routinely perform acts of magic; we somehow discern the price of tea in China by perusing scratches of ink on paper, and we manage to say true things about non-existent objects such as Zeus. The course centers on the problems of meaning and truth; how does language manage to refer to the world, and what is it for a sentence to be true? Related issues include identity across possible worlds, language learning, language games, the social character of language, the relativity of translation, and Chomsky's "deep grammar." Readings include Quine, Wittgenstein, Kripke, Frege, and Russell.
Fall semester. Schlossberger.

27. Metaphysics.
An exploration of selected topics arising out of traditional philosophical questions: What is there in the world? How do we know? Where does language fit in? Against the historical background of modern rationalism and empiricism, the course will focus especially on the critical approaches of Kant and Wittgenstein which have so affected contemporary thought.
Not offered 1985-86..

28. Marxist Philosophy.
Not offered 1985-86.

29. Nineteenth-Century Philosophy.
Nineteenth-century philosophers began to think historically, hoping to establish the natures of knowledge and morality by seeing how views about them emerge and evolve in a culture. Perhaps, it was suggested, agreement will be reached as a result of this evolution, if we can understand it. Whether historicism as a

method is compatible with objectivism about such topics as knowledge, morality, the existence of God, and the nature of the self will be studied by examining the historicist treatments of these topics put forward by Fichte, Hegel, Kierkegaard, Marx, and Nietzsche.
Not offered 1985-86. Eldridge.

34. Values and Ethics in Science and Technology.

(Also listed as Engineering 34.)
See Engineering 34.
Spring semester. Barus and Oberdiek.

38. Philosophy of Science.

The course will focus on issues connected with the nature and verification of scientific theories. Special treatment will be given to the nature of scientific change, growth, and development, giving an historical emphasis to the course.
Not offered 1985-86.

39. Existentialism.

Starting with the historical background and development of existential philosophy, the course will center around the 19th century thinkers Kierkegaard, Nietzsche, the Russian novelists, Tolstoy and Dostoyevsky, and the 20th century philosophers Heidegger, Sartre, and Camus. The main emphasis will be on the concepts of individual anxiety, death, freedom, and responsibility.
Spring 1986. Frede.

42. Philosophical Classics.

This course selects a single work for extended study in light of current and traditional criticism. Prerequisite: one philosophy course or instructor's consent.
Not offered 1985-86. Raff.

59. Catholic Social Thought.

The course will study the Catholic tradition of social thought, recent theoretical developments in that tradition, and its rapidly growing influence on social and political movements, especially in Latin America. The principal readings will be drawn from 1) Papal social encyclicals, 2) documents of the Second Vatican Council and Latin American Bishops' Conferences, 3) recent documents of the U.S. Catholic bishops on nuclear war and the economy, 4) writings of liberation theology. From time to time, selected applications of this theory, e.g. the growth of "base communities" in Brazil, will also be studied.
Also listed as Political Science 59, Religion 59.
Spring semester. Kurth and Lacey.

77. Colloquium: Theories of the Self in Romantic Literature and Philosophy.

At the end of the eighteenth century, philosophers and poets drew on the quest romance to develop new modes of writing that were at once literary and philosophic. Thus we find both philosophers (the German idealists) and poets (Novalis, Hölderlin, Schiller, Coleridge, Shelley, Keats, Wordsworth) tracking in their works the odysseys of human subjects from innocence to dawning self-consciousness, to alienation and dejection, and ultimately to a precarious self-integration. The kinds of writing which Wordsworth and Coleridge and Hegel and Schiller produced call into question our commonplace assumptions about the differences between philosophy and literature and about the aims of work in each field. Should the epistemological tradition be abandoned? Should we think of linguistic products in general as texts, all of which are to be studied in the same way, so that there are no real distinctions to be drawn between literary and non-literary works, or between fiction and non-fiction? What can literature and philosophy teach us about the nature of the self, and how?
Prerequisites: Introduction to philosophy *and* an introductory English course, or permission of the instructor.
Special interdisciplinary course.
Not offered 1985-86. Eldridge.

86. Topics in Philosophy and Psychology.

This new course will explore in depth different topics that are of interest and concern to both philosophers and psychologists. For Fall, 1985, the focus will be: Rationality and the Explanation of Human Action. In practical life, we usually explain human actions by giving the person's reasons—his or her goals and beliefs—for performing them. In contrast, in experimental science, we attempt to explain behavior by finding laws in accordance with which it occurs. We will explore the extent to which the categories of explanation that come from practical life constrain or limit the scope of scientific explanations. Doing this will involve a careful examination of the nature of explanation that we use in practical life. In addition to seeking people's reasons for action in order to

explain them, we use their reasons to provide the basis of a normative evaluation of actions. Beliefs, goals, and actions can be evaluated concerning their rationality. We will explore a number of different normative models of rationality: from philosophy, economics, biology, and psychology, and investigate empirical evidence about how well human behavior conforms to these models. We will be especially concerned with evaluating the rationality of goals—the criteria by which goals can be pursued. The course is open to students who have had at least the introductory course in both philosophy and psychology.
Also listed as Psychology 86.
Fall semester. Lacey and Schwartz.

87. Colloquium: Advanced Logic and Foundations of Mathematics.
A selection of topics from the following: metatheorems of first order logic, the incompleteness of first order axiomatic systems of arithmetic, recursive function theory, axiomatic theories of space and time, logical form and the structure of natural languages, philosophical foundations of arithmetic, foundations of geometry emphasizing problems of the nature of metrics. Two credits. Approval of instructor required.
Spring semester. Lacey.

89. Colloquium: Philosophy of the Social Sciences.
This colloquium will be an exploration of some central issues in the philosophy of social science, conducted through a detailed examination of the economic theory of rational consumer behavior. Questions to be considered include: how does the theory constitute an *explanation* of behavior? Does the way in which the theory represents values presuppose certain value commitments? What is the relationship of "positive" to "normative" (welfare) economics? What are the implications of the applications of this theory to political, legal, and personal relationships? Readings will include both classical and contemporary sources in economics and philosophy. May be taken for one or two credits.
Fall semester. E. Anderson.

93. Directed Reading. *Each semester.* Staff.

96. Thesis.
Fall semester. Staff.

97. Senior Conference.
Fall semester. Lacey.

SEMINARS

101. Moral Philosophy.
An examination of the principal theories of value, virtue, and moral obligation, and of their justification. Works of representative theorists, both classical (e.g., Aristotle, Hume, Kant, and Mill) and contemporary (e.g., Donagan, Gewirth, Mackie, and MacIntyre), will be studied.
Fall semester. Oberdiek.

102. Ancient Philosophy.
See Philosophy 14.
Fall semester. Frede.

103. Modern Philosophy.
The philosophical systems of Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume, or Kant, and their relations.
Spring semester. Staff.

104. Contemporary Philosophy.
One or more philosophical issues selected to illustrate 20th-century philosophical techniques and theories; such as: the nature of emotion, value, human action, personal identity, truth, God, or imagination. Readings include current contributions and 20th-century classics by Moore, Russell, or Wittgenstein.
Spring semester. Schlossberger.

106. Aesthetics.
See Philosophy 17.
Not offered 1985-86. Eldridge.

107. Logic and Foundations of Mathematics.
See Philosophy 87.
Spring semester. Lacey.

109. Metaphysics.
See Philosophy 27.
Not offered 1985-86.

110. Medieval Philosophy.
Not offered 1985-86.

111. Philosophy of Religion.
See Religion Department Preparation by course and attachment.

113. Theory of Knowledge.
Topics in epistemology selected to explore the nature and limits of rationality. Readings from current theorists or traditional theorists.
Not offered 1985-86.

114. Nineteenth-Century Philosophy.
See Philosophy 18.
Not offered 1985-86. Eldridge.

115. Language and Thought.
See Linguistics 107.

116. Philosophy of Language.
See Philosophy 26.
Fall semester. Schlossberger.

117. Philosophy of the Social Sciences.
See Philosophy 18.
Replaced in 1985-86 by Philosophy 89.

118. Philosophy of Psychology.
The study will center upon behaviorism, its various kinds, its critics, and alternatives to it, in particular cognitive theories. There will be selected topics from the methodological and philosophical foundations of behaviorism, types of theoretical concepts used in psychology, the explanatory function of various theoretical concepts (e.g., mentalistic and neurophysiological), the explanation of linguistic behavior, the compatibility of determinism with psychology, the relation between structural and functional explanation, criteria of choice between conflicting theories, the relevance of values to theory choice.
Not offered 1985-86.

119. History and Philosophy of Science.
An examination of some of the central problems in the philosophy of science (e.g., the nature of scientific explanations, the interrelationship between theory and observation, criteria for the acceptance of a scientific theory, the nature of scientific concepts) will be made through an analysis of important episodes in the history of physics. Writings of Aristotle, Copernicus, Kepler, Galileo, Descartes, and Newton will be studied, as well as contemporary writings in the philosophy of science.
Not offered 1985-86.

121. Social and Political Philosophy.
See Philosophy 21.
Spring semester. E. Anderson.

122. Philosophy of Law.
A study of concepts of law, including examination of the relationships between legal systems and other social and political institutions. Such issues as the proper relationship between law and morality, civil disobedience, legal enforcement of morality, and justification of punishment are considered. Readings in both historical and contemporary sources.
Spring semester. Oberdiek.

180. Thesis.
A thesis may be submitted by majors in the department in place of one Honors paper, upon application by the student and at the discretion of the department.

Physical Education and Athletics

GOMER H. DAVIES, Professor
ELEANOR K. HESS, Professor and Acting Chair[4]
ERNEST J. PRUDENTE, Associate Professor
DAVID B. SMOYER, Associate Professor and Chairman[1]
DOUGLAS M. WEISS, Associate Professor
SUSAN P. DAVIS, Assistant Professor
FRANCIS J. MEAGHER, Assistant Professor
MICHAEL L. MULLAN, Assistant Professor[1]
GAILE E. ROCKEY, Instructor
THOMAS ARANT, Assistant
DAVID BRONKEMA, Assistant[4]
BENEDICT CAYENNE, Assistant[5]
LAWRENCE EHMER, Assistant[4]
DIANE FREEDMAN, Assistant
LORI FRIES, Assistant
CURTIS A. LAUBER, Assistant[4]
HARBERT LEIMBACH, Assistant[5]
THOMAS RICHARDS, Assistant[4]
VALERIE RYAN, Assistant
C. J. STEFANOWICZ, Assistant[4]
DALE STRAWBRIDGE, Assistant[4]

The aim of the Department is to contribute to the total education of all students through the medium of physical activity. We believe this contribution can best be achieved through encouraging participation in a broad program of individual and team sports, dance, aquatics, and physical conditioning. The program provides an opportunity for instruction and experience in a variety of these activities on all levels. It is our hope that participation in this program will foster an understanding of movement and the pleasure of exercise, and will enhance, by practice, qualities of good sportsmanship, leadership, and cooperation in team play. Students are also encouraged to develop skill and interest in a variety of activities which can be enjoyed after graduation.

The intercollegiate athletic program is comprehensive, including varsity teams in twenty-two different sports, eleven for men and eleven for women. During many of these activities contests are arranged for junior varsity teams. Ample opportunities exist for large numbers of students to engage in intercollegiate competition, and those who qualify may be encouraged to participate in regional and national championship contests. Several club teams in various sports are also organized and a program of intramural activities is sponsored.

Students are encouraged to enjoy the instructional and recreational opportunities offered by the Department throughout their college careers. In the freshman and sophomore years all students not excused for medical reasons are required to complete a four quarter (two semester) program in physical education. All students must pass a survival swimming test or take up to one quarter of swimming instruction; classes for this purpose are offered in the fall quarter.

Courses offered by the Department are listed below. Credit toward completion of the Physical Education requirement will also be given for participation in intercollegiate athletics, as well

1 Absent on leave, fall semester, 1985.
4 Fall semester, 1985.
5 Spring semester, 1986.

as for the following two dance courses: Music—Dance 1 *(Introduction to Dance)* and Music—Dance 4 *(Intermediate Dance Technique)*. To receive credit for any part of the program students must participate in their chosen activity a minimum of three hours a week. Faculty regulations stipulate that students who have not fulfilled the Physical Education requirement will not be allowed to enter the junior year.

Fall Activities

Advanced Life Saving
Aquatics
Archery
Badminton
**** Cross Country
ǂ Field Hockey
Folk & Square Dance
*** Football
Jazz Exercise
Self-Defense
* Soccer
* Synchronized Swimming
* Tennis
Touch Football
** Volleyball
Weight Training

Winter Activities

Aquatics
** Badminton
* Basketball
Fencing
Folk & Square Dance
† Gymnastics
Jazz Exercise
Self-Defense
* Squash
**** Swimming
* Synchronized Swimming
Tennis
Volleyball
Water Safety Instructor
Weight Training
*** Wrestling

Spring Activities

Archery
Aquatics
Badminton
*** Baseball
Folk & Square Dance
* Golf
Jazz Exercise
**** Lacrosse
** Softball
Squash
* Synchronized Swimming
* Tennis
**** Track and Field
Volleyball
Water Safety Instructor (continued)
Weight Training

ǂ Intercollegiate competition for women
* Intercollegiate competition and course instruction.
** Intercollegiate competition for women, course instruction for men and women.
*** Intercollegiate competition for men.
**** Intercollegiate competition for men and women.

Physics

OLEXA-MYRON BILANIUK, Professor
JOHN R. BOCCIO, Professor and Chairman
MARK A. HEALD, Professor
PAUL C. MANGELSDORF, JR., Professor[2]
ALBURT M. ROSENBERG, Associate Professor[3]
RUSH D. HOLT, Assistant Professor
FRANK A. MOSCATELLI, Assistant Professor[3]
NILGUN SUNGAR, Instructor
MINGWHEI TUNG, Instructor
DAVID E. CHYBA, Assistant

The Physics Department offers two calculus-based introductory courses. Physics 1, 2 covers both classical and modern physics and is intended to be the proper introductory physics course for those students planning to take only one year of physics. Physics 3, 4, on the other hand, is aimed toward students planning to take further work in the Physics Department. It is the first half of a two-year introductory sequence consisting of 3, 4, 14, 15. Only those students taking the entire four semester sequence will have proper coverage of all major areas of physics.

Entering freshmen with strong physics background should see the Department Chairman if they are interested in taking advanced courses in the Department. Normally, Physics 3H, 4H is required prior to enrollment in Physics 14 or 15.

The Department offers a selection of courses (Physics 6, 7, 8, 9, 10, 21, 22, 24) that are suitable for nonscience majors seeking to fulfill the science distribution requirement.

Throughout the work of the Department, emphasis is placed on quantitative, analytical reasoning, as distinct from the mere acquisition of facts and skills. In all courses and seminars particular importance is attached to laboratory work, because physics is primarily an experimental science. External Examination candidates taking physics seminars accompanied by experimental work must submit their laboratory notebooks to the visiting examiners for their inspection.

In addition to curricular work, students are encouraged to pursue independent projects within faculty research programs. Good shop facilities, a wide range of electronic instrumentation, and extensive computing facilities are available in support of independent work.

The department sponsors a regular colloquium series with speakers chosen so that the talks are appropriate for undergraduates. In addition, students regularly give talks about research projects. The talks are sponsored by the local chapter of the Society of Physics Students of the American Institute of Physics.

REQUIREMENTS AND RECOMMENDATIONS

Students who intend to major in physics normally take Physics 3, 4, 5 and Chemistry 10 in the freshman year and Physics 14, 15 in the sophomore year. For freshmen prepared to enter Mathematics 6 the normal mathematics sequence for physics majors is Mathematics 6, 16, 16A or 16H, 18 or 18H, and 30, during the first four semesters, followed by Mathematics 81, 82. Students entering the mathematics sequence with Mathematics 5 may wish to defer Mathematics 30 until after their sophomore year. Students taking Physics 1, 2 may also continue with Physics 14, 15 and advanced work in the Department, although in most

2 Absent on leave, spring semester, 1986.
3 Absent on leave, 1985-86.

cases it will be necessary to include a half-credit tutorial in the sophomore year to expand the student's background in certain topics treated intensively in Physics 3, 4. Satisfactory work in an introductory course is prerequisite for all further work in the Department. In view of the extensive literature of physics in French, German, and Russian, it is recommended that the student acquire a reading knowledge of at least one of these languages.

Students wishing to major or minor in physics have several options available. The department offers both External Examination and Course programs, although all upper-level offerings use the seminar instruction format. A student majoring in physics in either case and planning to enter graduate school in physics would normally take Physics 101A/B, 102A/B, 103A/B, 104A/B, and Mathematics 81, 82 or equivalent. Physics 104 is not required for a major in physics.

Students in the External Examination program usually present four papers in physics and two papers selected from a minor subject area. Each physics paper is currently based on two single unit seminars. An External Examination major with three papers in physics and greater diversity in the minor subjects is not only an adequate program for a physics major going on to graduate school, but also constitutes an effective educational program for careers in law, medicine, and other professions in as much as the aim throughout is to achieve an understanding of fundamental ideas and concepts, as distinct from the mastery of a limited segment of science.

Course majors and double majors normally take ten course units of physics. Students in the course program and double majors take departmental comprehensive examinations during the last semester of their senior year.

Students not intending to do further work in physics but still wishing to pursue a program in physics that introduces the major areas of physics and the methods and techniques used to solve problems in physics should consider an eight-course physics major program. We feel such a program is useful for careers in many diverse fields and encourage consideration of this program by students planning to enter graduate or professional programs in other fields. The requirement of only eight courses should allow a full program in a second field of interest.

In collaboration with the Department of Astronomy, the Department offers a Special Major in Astrophysics, requiring a minimum of eight courses in Physics and four courses in Astronomy.

1, 2. Introductory Physics.

An introduction to selected concepts and applications of classical and modern physics. Vectors, Newtonian mechanics, special relativity, mechanical advantage, fluid mechanics, thermodynamics, electricity and magnetism, optics and optical instruments, waves, sound, and nuclear physics. Physics 5 must be taken concurrently with Physics 1. Laboratory and homework exercises include extensive use of interactive computing and computer graphics. Three lectures, a conference section, and a laboratory period weekly.
Prerequisite: Mathematics 4 completed or Mathematics 5 concurrently or comparable preparation in mathematics.
Tung and staff.

3. General Physics: Mechanics and Special Relativity.

A presentation of a unified view of physics through analysis of basic principles, their implications and their limitations. Special emphasis will be placed on analytical understanding of physical phenomena through the use of calculus and simple differential equations. Topics include vectors, kinematics in one, two, and three dimensions, Newton's laws and dynamics, conservation laws, work and energy, oscillatory motion, systems of particles, rigid body rotation about a fixed axis, motion in a gravitational field, and special relativity. Physics 5 must be taken concurrently with Physics 3. Laboratory and homework exercises include extensive use of interactive computing and computer graphics. Three lectures, a conference section, and a laboratory period weekly.
Prerequisite: Mathematics 5, 6 taken concurrently, or comparable preparation in mathematics.
Fall semester. Bilaniuk.

4. General Physics: Waves, Optics, and Electricity and Magnetism.

A continuation of Physics 3. Topics covered include wave phenomena, geometrical optics,

physical optics, electricity and magnetism, Maxwell's equations, direct and alternating-current circuits.
Spring semester. Staff.

3H, 4H. Freshman Seminar.

A half-credit course for students with Advanced Placement physics and mathematics preparation, or equivalent. Physics 5 must be taken concurrently with Physics 3H. A seminar meeting and a laboratory weekly. At the level of the Berkeley Physics Series.
Prerequisite: Permission of the department chairman.
Tung and staff.

5. Computing from the User's End.

(Also listed as Mathematics 6A and Economics 5.) A practical introduction to computer use including PR1ME 750 system procedures and commands, text editing and manuscript preparation, the BASIC programming language, TELLAGRAF graphics system and statistical packages including MINITAB. Assumes no prior background in computing or physics. One intensive lecture plus a workshop session per week; one-half course credit. Required of students enrolled in Physics 1 and 3, for whom the workshop is included in the regular laboratory session. Separate workshops stressing appropriate applications and examples will be provided for non-physics students.
Fall semester. Boccio.

6. Principles of the Earth Sciences.

An analysis of the forces shaping our physical environment, drawing on the fields of geology, geophysics, meteorology, and oceanography. Special emphasis on plate tectonics and geomorphology. Reading and discussion based on current literature. The underlying physical and chemical principles are stressed. Laboratory demonstrations and one or more field trips. No special scientific background required.
Not offered in 1985-86. Mangelsdorf.

7. Revolutions in Physics.

The problem of celestial motion and the Copernican revolution. The problem of terrestrial motion and Galileo. The Newtonian synthesis. Einstein's theory of relativity. Consideration of the nature of scientific revolutions. Some use of computer graphics will be taught. Includes weekly laboratory. Intended for nonscience majors.
Not offered 1985-86. Rosenberg.

8. The Physics of Living Machines.

The camera and the eye, and semiconductor devices and bioelectricity, sound detection and orientation, signal to noise discrimination, as illustrations of the importance of physical theory and instruments in understanding certain aspects of the living machine. Includes weekly laboratory. Intended for nonscience majors; not appropriate for pre-medical students.
Not offered in 1985-86. Rosenberg.

9. Order and Symmetry in Natural Systems.

Analysis of the forms seen in nature and the principles involved in producing those forms. Symmetries of designs and other geometrical objects. Interacting wave-like phenomena. Computer graphic displays will be used in producing various patterns. Includes weekly laboratory-workshop. Intended for nonscience majors.
Not offered in 1985-86. Rosenberg.

10. Analysis of the Perturbed Environment.

Problems associated with numbers and flow in the movement of people. Energy resources and distribution. Selected problems of pollution, including radioactive contamination. The computer will be used to simulate different ecological situations. The value and implication of these models will be sought. Where needed, basic physical concepts, computer techniques, and analytical methods will be taught. Lectures plus projects. Intended for nonscience majors.
Not offered 1985-86. Rosenberg.

14. Introduction to Quantum Physics.

An introduction to modern physics, including relativity, wave mechanics, Schrodinger equation applied to one dimensional systems, the world as a vector space, and properties of atoms, molecules, solids, nuclei, and elementary particles. The empirical basis of modern physics is emphasized. Three lectures, conference section, and laboratory weekly.
Prerequisites: Physics 3, 4; Mathematics 16, 16A, or 18 taken concurrently.
Fall semester. Mangelsdorf.

15. Statistical and Thermal Physics.

Basic methods and concepts appropriate for the treatment of systems consisting of very many particles. Statistical mechanics and thermodynamics are presented from a unified

point of view. The ideas of the atomistic nature of matter, concepts form quantum mechanics, and statistical postulates are combined to bring out conclusions about the macroscopic behavior of matter. Three lectures, conference section, and laboratory weekly.
Prerequisite: Physics 14.
Spring semester. Staff.

21. Principles of Aeronautics.

Principles of flight, elements of aircraft structure and performance, flight instruments, navigation aids and methods, flight meteorology, airspace utilization. Lectures, afternoon ground lab, field trips. No prerequisites, but enrollment limited. (The Department of Physics is officially certified by the F.A.A. as a Pilot Ground School.)
Not offered 1985-86. Bilaniuk.

22. Energy for Mankind.

The role of energy in the modern world. Renewable and nonrenewable energy resources, their present and potential use and abuse. The physical concept of work and energy. Fossil, hydroelectric, geothermal, tidal, wind, ocean, bio-mass, direct-solar, satellite-solar, nuclear fusion, and other energy sources; their respective advantages and disadvantages. Lectures and afternoon session (lab or field trip). Acceptable for science distribution requirement. No prerequisites, but enrollment limited because of field trips.
Not offered 1985-86. Bilaniuk.

23. Relativity.

A non-mathematical introduction to the idea and concepts in the special and general theories of relativity. Emphasis on spacetime diagrams and geometrical concepts.
Fall semester. Boccio.

24. Issues in Arms Control and Disarmament.

An examination of attempts to control nuclear and conventional weapons since World War II. Particular emphasis will be placed upon the SALT process and its alternatives, the internal and external constraints involved in negotiations, and the scientific and political factors involved in creating and controlling weapons systems. This course will not satisfy the distribution requirements.
Prerequisite: Permission of the instructors.
Not offered 1985-86. Holt and Frost.

31. Biophysics.

Ionizing radiation and biological damage. Bioelectrical potentials. Mechanisms of vision and hearing. Thermodynamics and life processes. Pattern formation. Force and shape. Automata. Optical data analysis. Applications of physical instrumentation. The course is intended for biological and physical science, mathematics, and engineering students.
Not offered 1985-86. Rosenberg.

40. Graphics, Modeling, and Simulation.

(Also listed as Economics 6). FORTRAN77, Techniques of graphics.Techniques for modeling and simulating complex biological, environmental, economic, societal and physical systems. Use will be made of the DISSPLA/GKS/DYNAMICS graphics subroutine package TELLAGRAF graphics systems and the DYNAMO modeling/simulation package. Integration of computer graphics into models and simulations. Color graphics. Introduction to Waiting-Line simulations and Monte Carlo methods.
Prerequisite: Permission of instructor.
Fall semester. Boccio and Hollister.

51. Science, Decision-making, and Uncertainty.

A study of decision-making as it relates to scientific and public policy matters. The course covers philosophical, psychological, and mathematical aspects of decision-making in the face of uncertain evidence. Topics covered include the nature of scientific evidence and experimentation; probabilistic evidence and the law; uncertainty and medicine; inferential vs. Bayesian statistics; human decision-making, rational and irrational; techniques and correctives of decision-making. The theories will be related to such public issues as nuclear power, hazardous waste disposal, vaccination programs, and strategic nuclear planning.
Prerequisites: Permission of instructors.
Cross-listed in physics, mathematics, and psychology.
Iversen, Kellman, and Holt.

63. Procedures in Experimental Physics.

Laboratory work directed toward the acquisition of knowledge and skills which will be useful in future research. Techniques, materials, and the design of experimental apparatus. Shop practice. Printed circuit design and construc-

tion. Half-credit course.
Fall semester. Staff.

93. Directed Reading or Project.

This course is to provide an opportunity for individual students to do special work, with either theoretical or experimental emphasis, in fields not covered by the regular courses and seminars. The student will present oral and written reports to the instructor.

94. Experimental or Theoretical Research.

Initiative for a research project may come from the student, or the work may involve collaboration with on-going faculty research. The student will present a written and an oral report to the Department.

SEMINARS

The seminars 102A/B, 103A/B have an associated laboratory program. The laboratory meets one afternoon per week. Laboratory programs include substantial set-piece experiments and projects.

101A. Intermediate Mechanics.

A general study of classical mechanics. Topics include: motion of a particle in one, two, and three dimensions. Kepler's laws and planetary motion. Phase space. Oscillatory motion; damping; nonlinear effects. Lagrange equations and variational principles. Systems of particles; collisions and cross sections. Motion of a rigid body in two and three dimensions; Euler's equations. Rotating frames of reference. Small oscillations and normal modes. Wave phenomena in one and two dimensions.
Prerequisites: Physics 3, 4; Math 30.
Fall semester. Boccio.

101B. Intermediate Electricity and Magnetism.

A general study of electricity and magnetism using vector calculus. Topics include: Electric and magnetic fields. Dielectric and magnetic materials. Electromagnetic induction. Development of Maxwell's field equations in differential form. Displacement current, Poynting theorem and electromagnetic waves. Simple boundary value problems.
Fall semester. Heald.

102A. Quantum Physics: Theory.

A more formal continuation of Physics 14. Topics include: Review of classical concepts. Postulates of quantum mechanics. Operators, eigenfunctions, and eigenvalues. Function spaces and hermitian operators; BRA-KET notation. Superposition and observables. Time development, conservation theorems, and parity. One dimensional systems. Two dimensional systems. Angular momentum. Three dimensional systems. Matrix mechanics and spin. Coupled angular momenta. Time-independent perturbation theory. Time-dependent perturbation theory. Transition rates. Scattering.
Prerequisites: Phys. 15 and 101A/B; Math 81, 82 (concurrent).
Spring semester. Staff.

102B. Quantum Physics: Applications.

Directly integrated with Physics 102A. Topics include: Review of history. Relativistic dynamics. Atomic physics; spectroscopy. Solid-state physics. Nuclear physics. Fission and fusion.
Spring semester. Staff.

103A. Electrodynamics.

Applications of Maxwell's equations Boundary value problems in curvilinear coordinates; special functions. Waveguides, antennas, radiation. Classical election theory. Four-vector formulation of relativistic electrodynamics. Microscopic theory of the electrical and magnetic properties of materials. Plasma physics. Superconductivity.
Prerequisites: Physics 101A/B; Mathematics 81, 82.
Fall semester. Holt.

103B. Waves and Physical Optics.

Geometrical optics. Acoustic waves. Dispersive media. Waves in three dimensions. Electromagnetic wavces. Superposition. Reflection and refraction. Interference. Fraunhofer and Fresnel diffraction. Polarization. Spectrometers and interferometers. Fourier analysis. Sources and detectors. Crystal optics. Matrix optics. Lasers. Coherence. Holography. Nonlinear optics. Quantum aspects of light.
Fall semester. Staff.

104A/B. Senior Seminars.
An intensive investigation of one or more advanced topics such as:

Astrophysics
Atomic physics; spectroscopy
Fluid dynamics
General relativity
Nuclear physics
Particle physics
Philosophy of physics
Plasma physics
Quantum optics; lasers
Solid state physics
Statistical physics
Topics in mathematical physics
Topics in physics and public policy

A few seminars comprised of a single subject or a combination of subjects selected from the list above will be offered each year. Actual choices will vary from year to year depending on available faculty and student interests.
Spring semester. Boccio.

Political Science

CHARLES E. GILBERT, Professor
RAYMOND F. HOPKINS, Professor
JAMES R. KURTH, Professor
DAVID G. SMITH, Professor and Chairman
CHARLES R. BEITZ, Associate Professor
DOUGLAS C. BENNETT, Visiting Associate Professor
RICHARD L. RUBIN, Associate Professor of Political Science and Public Policy (part-time)
KENNETH E. SHARPE, Associate Professor[3]
VALERIE C. RUBSAMEN, Instructor

Courses and seminars offered by the Political Science Department deal with the place of politics in society and contribute to an understanding of the purposes, organization, and operation of political institutions, domestic and international. For the beginning student, the Department offers courses dealing generally with the basic concepts of political science and the processes of politics as illustrated by case studies, by theoretical analysis, and by more extended study of politics in various institutional settings. In appropriate places throughout the curriculum attention is focused on problems of change (evolutionary and revolutionary), freedom and authority, war and peace—and on the development of political institutions that are responsive to the needs of our day. Courses are provided that give special attention to political theory, comparative political systems, international politics, and politics in the United States.

REQUIREMENTS AND RECOMMENDATIONS

Students planning to study political science are advised to start with either Elements of Politics (Political Science 1) or Policy-Making in America (Political Science 2). They should then continue with one or more other introductory courses offered in the second semester: Policy-Making in America (Political Science 2), Comparative Politics (Political Science 3), and International Politics (Political Science 4). Normally any two of these courses, preferably including Political Science 1 or Political Science 2, constitute the prerequisite for further work in the Department and are particularly recommended for majors. Students who intend to major in political science should begin their work in the freshman year if possible. Supporting courses strongly recommended for all majors are Statistics for Observational Data (Mathematics 1); and Introduction to Economics (Economics 1-2). Political Theory, either in seminar for Honors candidates, or in Course (Political Science 54 or 55) for Course students, is required of all majors.

Concentration in International Relations: This concentration, designed for students especially interested in a career in international relations or planning a career involving overseas work, is described on page 140. Students may elect this concentration while majoring in several alternative departments including history, economics, and modern language. For political science majors concentrating in international relations the comprehensive requirements for course majors are adjusted to allow students to demonstrate graduation level competencies appropriate to work done in the concentration. Similar options may be approved by the department for students in the external examination program. Details for each program are worked out with the Coordinator of the concentration.

Concentration in Public Policy: This concentration, designed for students expecting to prepare for work in government or to pursue further study in the field of public policy is described

3 Absent on leave, 1985-86.

on page 202. The normal political science comprehensive requirements apply, but these allow students flexibility in preparing to graduate, in either the course or external examination programs, so that they may have work reviewed and/or competency tested in their policy concentration.

Comprehensive Requirement: Majors not sitting for the external examination should review their programs periodically with the department, normally with the chairman. All work programs in the department should be prepared with a view to meeting the distributional requirements of the comprehensive examinations. The department recommends for graduation students be able to write papers that demonstrate three competencies: use of empirical evidence, analysis of political theory, and evaluation of policy. Students must also show knowledge of material in at least three of the four major subfields of the discipline: political theory, American politics, comparative politics, and international politics. Usually papers originally prepared in a course best serve as the basis for meeting the comprehensive requirement. More detailed information on this exercise and its implication for course selection is offered during the junior year. Information on comprehensive requirements is available in the political science department office. Comprehensive qualifying papers must be submitted well before the end of the senior year.

1. Elements of Politics.

Designed to probe some major questions of politics, this course asks: Who governs in the interests of whom? How? What are the sources of political stability and change? How is political power created, maintained, or challenged? Answering these questions will involve a study of the basic institutions, concepts, and moving forces of politics and exploring problems such as justice, freedom, equality, and obligation. Materials will be drawn from the United States and other countries.
Fall semester. Staff.

2. Policy-Making in America.

Consideration of basic elements of American national politics, and of ways of defining and explaining the functions and results of American politics. Major attention will be devoted to electoral organizations, voting behavior and opinion formation, legislation and presidential leadership, administration and policy choices.
Each semester. Staff.

3. Comparative Politics.

An introduction to theories of comparative politics and to the data used in comparing political systems. Major attention will be given to the political systems of Western Europe, particularly Britain, France, West Germany, Italy, and Spain. The course will focus on political culture; political crises; political parties, including Communist, anarchist, and fascist movements; and contemporary political institutions and policy-making.
Spring semester. Staff.

4. International Politics.

An introduction to the analysis of the contemporary international system and its evolution in the twentieth century. The course will examine various approaches to explaining wars, interventions, and international economic conflicts.
Spring semester. Staff.

11. Problems in Community Government.

The social, economic, and legal setting of American local government. Politics and administration at state and local levels, with emphasis on city and suburbs. Problems of federalism and metropolitan areas. Various public functions or policies—e.g., planning, housing, law enforcement—are considered as they relate to governmental capacities, private interests, and political values.
Spring semester. Gilbert.

14. American Foreign Policy.

An examination of the making of American foreign policy and of the major problems faced by the United States in the modern world. The course will focus on the influence of political, bureaucratic, and economic forces and on the problems of war, intervention, and economic conflict.
Fall semester. Not offered 1985-86.

18. Political Development.

An examination of the political conditions of social change and economic development. The processes which promote change and affect the stability and capacity of political systems will be considered in the context of a diverse group of third world states.
Spring semester. Hopkins.

19. Comparative Communist Politics.

A comparative study of the various communist countries, with special attention to the Soviet Union and the Chinese People's Republic. Analysis of differences in goal structures, modes of rule, and social development as a function of the interaction between legacies of the paths to power, domestic political conflict, and economic imperatives.
Spring semester. Not offered 1985-86.

20. Politics of China.

An analysis of critical elements in Chinese politics: the historical legacy, ideology, policy-making, policy implementation, economic programs, and foreign policy.
Fall semester. Not offered 1985-86.

21. Politics of Africa.

A survey of political forces in contemporary Africa. Selected countries will be studied to illuminate important aspects of political change including traditional attitudes, leadership, ethnic rivalry, socialism, neocolonialism, military intervention, national integration, and international involvements.
Fall semester. Hopkins.

22. Latin American Politics.

This introduction to Latin American politics will explore such topics as the colonial legacy of Latin America; the difficulties of creating viable political institutions; contemporary sources of instability, revolution, and military intervention; the different meaning of politics for various groups (Indians, peasants, workers, middle-class groups, industrialists, landowners, etc.); and the economic and political difficulties raised by U.S.-Latin American relations. These topics will be approached through a comparative study of such countries as Brazil, Chile, Cuba, Mexico, and Argentina.
Spring semester. Bennett.

40. The Vietnam War.

The aim of this course is to explore the reasons for U.S. military involvement in Vietnam in the 1950s and 1960s and for the military withdrawal in the 1970s. Topics include Vietnam's colonial background; the defeat of the French and the partition of Vietnam in 1954; the U.S. military commitment; foreign policy in the Kennedy-Johnson years; the anti-war movement; the Nixon policy of "Vietnamization"; and the effects of the war on Cambodia and Laos.
Fall semester. Mr. Beitz.

41. Defense Policy.

Analysis of the history and structure of American defense policy since World War II, with particular emphasis on the choice of weapons systems and military strategies. Political, economic, bureaucratic, and other explanations of past and present policies will be explored.
Fall semester. Kurth.

42. Health Policy.

(Also listed as Economics 42.) Analysis of governmental policy toward health care and public health, its impact upon institutions and resource allocation, and major alternatives for action. Central topics are the organization of health care delivery (roles and views of physicians, nurses, administrators, patients and insurers); the interplay of federal, state, and local governments, quasi-public authorities, and interest groups; technical and political aspects of health insurance alternatives; health manpower (medical and nursing schools, paraprofessionals); biomedical research programs. Students wishing to take this course should consult in advance with the instructors. Prior work in at least two of the following will be helpful: Economics 1-2, 4, 26; Political Science 2, 51; Mathematics 1; Engineering 4, 32.
Spring semester. Hollister and Smith.

43. Food Policy: National and International Issues.

The causes and possible solutions to major food problems: hunger, rural poverty, and food insecurity. The role of government policy in production, distribution, and consumption of food. Principal focus will be upon the American agricultural experience, food systems in less developed countries, international trade and aid as solutions, and international measures to improve food security. A field trip, an early final exam, and a substantial paper are features of the course. Students with little work in political science may be admitted with the consent of the instructor.
Fall semester. Hopkins.

44. Race, Ethnicity and Public Policy.

An analysis of important policy questions with direct and indirect bearing on racial and ethnic groups. The focus of the course is on: 1) the political institutions that shape the formulation

of policy (elections and parties, courts, administrative agencies); 2) specific policy areas of contemporary conflict (housing, education, employment); 3) the various mechanisms (affirmative action, quotas, targeted job aid) used as remedies. The format will be discussion. Suggested prerequisite either Political Science 1 or 2.
Fall semester. Rubin.

50. Public Law and Public Administration.

Theory and practice of administrative law in the United States. Role of the courts in governmental administration. Issues of organization and procedure. The interaction of public law and public policy, with particular attention to certain sectors of public policy.
Fall semester. Gilbert and Smith.

51. Topics in Public Administration and Policy.

Problems of policymaking and administration, primarily in American national government, from the standpoints of public-policy analysis and democratic theory. Central topics include: accountability, responsibility, and productivity; organization theory and governmental reorganization; budgeting, planning, and "rational" decision; public relations and clientelism; regulation and public enterprise; administrative law; intergovernmental relations; Congress, Presidency, and administration.
Spring semester. Gilbert.

52. American Constitutional Law.

The role of the Supreme Court in the American political system, viewed both historically and through analysis of leading cases. Areas of constitutional law and development emphasized are: the nature and exercise of judicial review; federalism and the scope of national power; due process, equal protection, the First Amendment, and other civil liberties.
Open to sophomores and upperclassmen.
Fall semester. Smith.

53. American Party Politics.

An historical and functional analysis of American political parties. The study of interest groups, public opinion and voting behavior, electoral systems and representation, the legislative process.
Fall semester. Not offered 1985-86. Rubin or Gilbert.

53B. The Mass Media and American Politics.

An historical and contemporary consideration of the effects of mass media on American political institutions and political behavior. Special emphasis on the transformation from print to electronic media and its impact upon political parties and governmental institutions.
Fall semester. Not offered 1985-86. Rubin.

53C. Presidential Politics.

The central focus of the course is on electoral connections between public opinion, political organizations and institutions, and the exercise of presidential power.
Fall semester. Rubin.

54. Political Theory: Plato to Machiavelli.

The development of political thought in the ancient and medieval periods, and the emergence of a distinctively modern political outlook. Topics considered include: the origins, functions, and purposes of the city-state; the role of law and knowledge in government; the relation of ethics and politics; justice, and its relation to Greek and Christian thought. Recommended for students who plan to take the Political Theory seminar.
Fall semester. Bennett.

55. Modern Political Theory.

A study and critique of liberalism through close reading and analysis of the writings of such theorists as Hobbes, Locke, Rousseau, Bentham, J.S. Mill, Marx, and Rawls. The course will consider problems regarding liberty, political obligation, the common good, human nature, and distributive justice. *Not open to students who plan to take the Political Theory seminar.*
Spring semester. Beitz.

56. Contemporary Political Theory.

An examination of political theory from Marx and J.S. Mill to present. Among other topics a special concern will be the ability of contemporary liberal political and economic thought to respond to its critics' attacks on its psychological and epistemological foundations, and on its adequacy as a guide to political understanding and action. An effort will be made to understand the various and often conflicting currents within liberal theory, as well as to identify certain common problems. Marxist, existentialist, anarchist, and structuralist critics may

be considered.
Prerequisite: Political Science 55 or permission of the instructor.
Spring semester. Not offered 1985-86. Sharpe or Beitz.

57. Jurisprudence.

An exploration of the concept of law as it has been understood by lawyers, judges, philosophers, and social scientists. Issues to be considered include the nature and validity of law, the relation of law to morality, and the place of political theory in the judicial decision. Some current moral issues in law may be discussed. Readings will be chosen from classical and contemporary works in the philosophy and social science of law as well as from representative cases.
Spring semester. Beitz or Smith.

58. International Political Theory.

An examination of several important moral problems in international affairs. Topics to be discussed include the morality of war, war crimes and the rules of warfare, and the ethics of nuclear deterrence; intervention, self-determination, and the moral status of the nation-state; and international distributive justice. Readings will be selected from classical and contemporary sources.
Spring semester. Beitz.

59. Catholic Social Thought.

(Also listed as Philosophy 59 and Religion 59.) The course will study the Catholic tradition of social thought, recent theoretical development in that tradition, and its rapidly growing influence on social and political movements, especially in Latin America. The principal readings will be drawn from 1) Papal social encyclicals; 2) documents of the Second Vatican Council and Latin American bishops on nuclear war and the economy; 3) writings of liberation theology. From time to time, selected applications of this theory, e.g., the growth of "base communities" in Brazil will also be studied.
Spring semester. Kurth and Lacey.

60. Special Topics in Political Science.

Open to senior Course majors in Political Science. Devoted to the preparation of three qualifying papers in the senior year.
Spring semester. Members of the Department.

62. Colloquim and Research Project on Presidential Elections.

The principal requirement of this course is the successful completion of an independent research project that examines a single presidential election campaign between 1952 and 1984. There will be background readings and discussion of the presidential election system, the dynamics of shifting groups in coalitions, and the role of the mass media. Each student will be doing an independent research paper. Topics for papers include analyzing candidate images, political themes, public opinion, and campaign strategies during a particular election year, putting the specific campaign in the broader context of election cycles, institutional changes, and shifts in public policy. Enrollment will be limited; interested students should see Professor Rubin for permission.
Prerequisite: Political Science 2 and/or an advanced course in American politics.
Fall semester. Not offered 1985-86. Rubin.

64. Political Socialization and Schools.

(Also listed as Education 64. See course description under Program in Education.)
Fall semester. Travers.

65. Political Psychology.

A psychological examination of individuals' participation in and impact upon politics and the effect of various political systems on individuals. Personality differences and psychological processes are examined both for political leaders and for the general public. Topics thus include psychobiographies of presidents and other leaders; psychological distortion in political decision; personality types among the public psychological factors in public opinion and revolution. Projects may involve class or individual research. (Crosslisted as Psychology 65.)
Fall semester. Not offered 1985-86. Peabody.

66. Energy Policy.

(Also listed as Engineering 66.) Presentation and exploration of political, economic, and technological issues affecting development of energy policy, and investigation of the influence of energy policy on policymaking in other areas. Possible topics include: development of the U.S. Energy bureaucracy; international political/economic decisionmaking and OPEC; development and impact of energy price

decontrol; economic and political aspects of U.S. energy technology exports; economic and environmental perspectives of energy resource development (renewable and otherwise). Suggested preparation includes Economics 1-2 and Political Science 2 or 51. Enrollment by permission of instructors.
Fall semester. Not offered 1985-86.

67. Social Insurance and Welfare Policy.

(Also listed as Economics 67.) The principal American policies and programs dealing primarily with relief of poverty and economic insecurity, and the prospects and options for reform in this field. Topics include: Social Security, national health insurance, unemployment compensation, and welfare reform. The various public objectives and methods of income support and related social services, as well as certain contextual or alternative programs and regulatory policies. Conceptions of "welfare"; economic, social, political, and administrative or professional considerations in policy; historical and comparative perspectives. Intended as a single- or double-credit seminar for students in the Public Policy Concentration and open for single credit to others who have taken appropriate Public Policy prerequisites, on which consult the Catalogue and, as to exceptions, one of the instructors.
Spring semester. Not offered 1985-86. Gilbert and Hollister.

68. Environmental Policy.

(Cross-listed as Engineering 68.) Issues in environmental policy formulation and implementation are explored. Both of these aspects require understanding of environmental processes including natural and technological processes. Trade-offs between environmental and economic objectives are examined using quantitative policy models. Enrollment is by consent of the instructor. Operations Research and/or Statistics are recommended as prerequisites.
Spring semester. Not offered 1985-86. McGarity.

69. Political Economy of Macroeconomic Policy.

(Also listed as Economics 91). The course treats together the economic and political aspects of public policy on employment, output, and the price level. The course focuses on both theory and selected modern episodes in American experience and policy. Intended as a single- or double-credit seminar for students in the Public Policy Concentration and open for single credit to others who have taken appropriate Public Policy prerequisites, on which consult the Catalogue and, as to exceptions, one of the instructors.
Prerequisite: Political Science 1 or 2 and Economics 1 and 2.
Spring semester. Gilbert and Pack.

93. Directed Readings in Political Science.

Available on an individual or group basis, subject to the approval of the chairman and the instructor.

96. Thesis.

With the permission of the chairman and a supervising instructor, any major in Course may substitute a thesis for one course, normally during either semester of the senior year.

SEMINARS

The following seminars prepare for examination for a degree with Honors:

101. Political Theory.

An analytical and critical examination of the philosophical foundations of liberalism and socialism, drawing on the writings of theorists from Hobbes to Marx and including works of some contemporary political philosophers. The subjects considered include such problems as the nature of legitimate authority, the basis of political obligation, liberty, and democracy. Particular attention will be given to the question of distributive justice and the relevance of Marx's political and philosophical writings to liberal theory.
Each semester. Beitz.

102. Politics and Legislation.

The study of political parties, interest groups, public opinion and voting behavior, electoral systems and representation, the legislative process. Emphasis is on American politics, with some comparative material; and, ultimate-

ly, on politics from the standpoint of theories of political democracy.
Spring semester. Gilbert.

103. Problems in Government and Administration.

Problems of administrative organization, policy-making and responsibility, with primary reference to the United States and to selected fields of policy.
Fall semester. Gilbert.

104. International Politics.

An inquiry into problems in international politics. Topics will include (1) competing theories of international politics, (2) war and the uses of force, and (3) the management of various global issues such as food and energy.
Prerequisite: Political Science 4 or the equivalent.
Spring semester. Hopkins.

105. American Foreign Policy.

A study of key problems faced by the United States in the modern world together with a critical investigation of the making and implementing of American foreign policy. A variety of explanations of American foreign policy will be discussed and evaluated, and the political, economic, and social influences upon it will be considered. Key assumptions of United States policy-makers will be subjected to scrutiny, and alternate assumptions and policies will be analyzed.
Fall semester. Kurth.

106. Public Law and Jurisprudence.

A study of the sources and nature of law; historical, sociological, philosophic, "realistic," and behavioral approaches to jurisprudence; the nature of the judicial process and other problems of jurisprudence, illustrated by judicial decisions and other legal materials relating to selected areas of law.
Spring semester. Smith.

107. Comparative Communist Politics.

A comparative study of the various communist countries, with special attention to the Soviet Union and the Chinese People's Republic. Analysis of differences in goal structures, modes of rule, and social development as a function of the interaction between legacies of the paths to power, domestic political conflict, and economic imperatives.
Fall semester. Not offered 1985-86.

108. Comparative Politics: Europe.

A comparative study of the political systems of Western Europe. The major countries examined will be Britain, France, Germany, Italy and Spain. Topics will include (1) competing theories of comparative politics, (2) the relationships between economic development, economic crises, and political conflict, (3) political parties, including communist, anarchist, and fascist movements, and (4) contemporary political institutions and policy-making.
Prerequisite: Political Science 3 or the equivalent.
Spring semester. Rubsamen.

109. Comparative Politics: Africa and the Third World.

A comparative study of the politics of societies undergoing change and pursuing "development." Various theories, approaches, and methods of explanation are examined and considered in the context of Africa and the third world.
Fall semester. Hopkins.

110. Comparative Politics: Latin America.

A comparative study of the politics of several Latin American countries: Chile, Brazil, Cuba, Mexico, Peru, Argentina, the Dominican Republic. The course will focus on important differences in major institutions, class structures and social values, and an examination of various theories explaining political stability and change. Problems will include: difficulties of creating stable democratic institutions; causes and results of revolutions, coups, and military interventions; different meanings of politics for various classes in socialist, corporatist, and (formerly) democratic regimes; and the utility of dependency theory in explaining U.S.-Latin American relations.
Spring semester. Bennett.

180. Thesis.

All members of the Department.

Psychology

KENNETH J. GERGEN, Professor
DEAN PEABODY, Professor[2]
ALLEN M. SCHNEIDER, Professor
BARRY SCHWARTZ, Professor and Department Head
ALFRED H. BLOOM, Associate Professor[2 11]
DEBORAH G. KEMLER NELSON, Associate Professor
JEANNE MARECEK, Associate Professor
PHILIP J. KELLMAN, Assistant Professor
LEIGHTON C. WHITAKER, Director of Swarthmore College Psychological Services
HANS WALLACH, Research Psychologist

The work of the Department of Psychology deals with the scientific study of human behavior and experience; processes of perception, learning, thinking, and motivation are considered in their relation to the development of the individual personality, and to the relations of the individual to other persons.

The courses and seminars of the Department are designed to provide a sound basis of understanding of psychological principles and a grasp of research method. Students learn the nature of psychological inquiry and the psychological approach to various problems encountered in the humanities, the social sciences, and the life sciences.

A special major is available in conjunction with Linguistics emphasizing fundamental issues in human cognitive organization. A full description of this program may be found under Linguistics.

A special major in Psychobiology is available in cooperation with the Department of Biology. See the requirements listed below.

REQUIREMENTS AND RECOMMENDATIONS

Psychology 1 (formerly Psychology 3), Introduction to Psychology, is normally a prerequisite for further work in the Department.

A Course major consists of at least eight courses, excluding courses cross-listed in psychology that are taught by members of other departments, and normally including four of the core courses (with course numbers in the 30's): Physiological Psychology, Learning and Behavior Theory, Perception, Cognitive Psychology, Psychology of Language, Social Psychology, Personality, Abnormal Psychology, and Child Development. Those wishing to substitute more individualized programs should present their reasons in writing. Majors should take at least one course providing them with experience in research. In addition, majors in Course are encouraged to enroll in Psychology 98 during their senior year. In 1985-86 it will be given in the Fall semester. This course is intended to provide integration of different fields of psychology and to offer majors one way to meet the comprehensive requirement. Students intending to pursue graduate work in psychology will also find it useful to take one of the statistics courses offered by the Department of Mathematics.

A major in the External Examination Program consists of three or four seminars taken in preparation for external examinations. A minor usually consists of two seminars. Seminars are offered in Abnormal Psychology, Child Development, Cognitive Psychology, Individual in Society, Language and Thought, Learning and Behavior Theory, Perception, Personality, Philosophy of Psychology, and Physiological Psychology. Some seminars meet during one semester for two credits, while others consist of

2 Absent on leave, spring semester, 1986.
11 Joint appointment with linguistics.

a one-credit course offering plus a one-credit seminar in different semesters. (See seminar listings.) A thesis (either empirical or library research) may be substituted for one seminar. Students may, with approval, prepare for an external examination by combining two courses or a course and an independent study.

Special Major: Psychobiology. The Departments of Psychology and Biology offer a special major that combines work in the two departments, for students who are interested in the biological basis of behavior. The major consists of a set of core courses, and three groups of optional courses. Majors are required to take all of the core courses, and at least two courses from each of the three groups of optional courses.

Requirements. Entry: For admission to the major, students must have completed at least two courses in each of the two departments, and must have completed Mathematics 2, Chemistry 10 and 22. (Students who have not completed these courses at the time of application will be deferred until they have done so.) Core: Biology 1 and 2; Psychology 1; Psychology 30 or 109. Optional: Group 1: *Biological Foundations* – Biology 12, 20, 21, 52, 56, 57, 76, 78, 178, Chemistry 58; Group 2: *Biobehavioral Foundations* – Biology 25, 45, 69, 160, Psychology 31, 131, 32, 132, 43, 48, 87; Group 3: *Psychological Processes* – Psychology 33, 133, 38, 138, 39, 139, 50, 61, 91, 109. The comprehensive requirement is met by passing an examination or completing a senior paper (Psychology 96, 97). External Examination Program: A program in Psychobiology can be pursued by designating one department as the major, the other as the minor, and choosing a set of courses and seminars from the above list. Interested students should consult the heads of the two departments.

1. Introduction to Psychology.

An introduction to the basic process underlying human and animal behavior, studied in experimental, social, and clinical contexts. Analysis centers on the extent to which normal and abnormal behavior are determined by learning, motivation, neural, cognitive, and social processes. (Formerly Psychology 3)
Each semester. Staff.

6. Critical Issues in Psychology.

An exploration of selected issues in psychology. Emphasis is on how one tries to answer theoretical questions, especially by analyzing the relation between psychological theories and the evidence testing them. This analysis is applied to previous critical experiments and in planning new research. The topics covered may vary from year to year; the department can supply information on the coverage in a particular year. Intended to complement Introduction to Psychology, this course will emphasize student participation and discussion. Strongly recommended for those who may take further courses or seminars in psychology. Limited enrollment.
Peabody.

21. Educational Psychology.

(See Education 21.)
Fall semester. Staff.

22. Counseling.

(See Education 25.)

23. Adolescence.

(See Education 23.)
Spring semester. Smulyan.

24. Psychological Anthropology.

(See Sociology/Anthropology 24.)
Spring semester. Piker.

30. Physiological Psychology.

A survey of the neural and biochemical bases of behavior with special emphasis on sensory processing, motivation, emotion, learning, and memory. Both experimental analyses and clinical implications are considered.
Spring semester. Schneider.

31. Learning and Behavior Theory.

The experimental analysis of the major phenomena of learning and conditioning is considered mainly at the animal level, with particular attention to the theories of B. F. Skinner. Specific empirical and theoretical issues are considered in detail, and the major theories are evaluated. The course includes a laboratory, which is designed to acquaint students with the processes considered.
Fall semester. Schwartz.

32. Perception.

An exploration of the connections among our experience, the physical world, and our biology. Theories of direct perception are contrasted with those asserting the importance of inference or hypothesis in perceiving. Primary

emphasis is on research in adult visual perception, but other senses and some developmental issues are also treated. Implications of the study of perception for the theories of knowledge and the visual arts are examined. There is laboratory work, including an original experiment conducted by the class.
Fall semester. Kellman.

33. Cognitive Psychology.

A broad overview of the psychology of knowledge. Models of human cognition are examined in light of experimental data. Attention, pattern recognition, memory, concepts, thinking, and problem solving are treated, among other topics. Laboratory exercises and demonstrations are included to acquaint students with the issues and methods in the field.
Fall semester. Kellman.

34. The Psychology of Language.

(See Linguistics 34).
Spring semester. Bloom.

35. Social Psychology.

An examination of theory and research relevant to the understanding of social interaction. Special emphasis is placed on the social construction of reality, rules of relationship, and social life as drama.
Spring semester. Gergen.

36. Personality.

An examination of contrasting theories of the human personality. Theories of Freud, Jung, Fromm, Rogers, and others will be discussed, and special attention will be given to current research work.
Fall semester. Gergen.

38. Abnormal Psychology.

A survey of major forms of psychopathology in adults and children. Biogenetic, socio-cultural, and psychological bases of abnormality are examined, along with their corresponding modes of treatment.
Spring semester. Marecek.

39. Child Development.

A selective survey of cognitive and social development from infancy to adolescence. Major theoretical perspectives on the nature of developmental change are examined, including those of Piaget and his critics. Topics include the growth of perceptual and cognitive skills, the acquisition of language, gender typing, and personality theory in a developmental context.
Fall semester. Kemler Nelson.

41. Science, Decision-making, and Uncertainty.

A study of decision-making as it relates to scientific and public policy matters. The course covers philosophical, psychological, and mathematical aspects of decision-making in the face of uncertain evidence. Topics covered include the nature of scientific evidence and experimentation; probabilistic evidence and the law; uncertainty and medicine; inferential versus Bayesian statistics; human decision-making, rational and irrational; techniques and correctives of decision-making. The theories will be related to such public issues as nuclear power, hazardous waste disposal, vaccination, and strategic nuclear planning. Cross-listed with Physics and Mathematics.
Spring semester. Holt, Iversen, and Kellman.

42. Human Intelligence.

This course adopts a broad view of its topic, Human Intelligence. One major set of subtopics will be drawn from the intelligence-testing (IQ) tradition and the controversies emerging from it—including the heritability of IQ, the relation between IQ and academic success, between IQ and creativity, the nature of mental retardation, and the conception of intelligence as a general trait or as a set of specific abilities. Other and less traditional concerns will be cognitive theories of intelligence, everyday conceptions of intelligence, the relation between infant and adult intelligence, and the relation between human and animal intelligence.
Fall semester. Kemler Nelson.

43. Comparative Cognition.

An exploration of cross-cultural research on human cognition. What are the universals of human cognition? What are its distinctive features? What are the major factors that are responsible for cross-cultural variation in human cognition? What are the virtues and pitfalls of comparative approaches to the study of cognition? The course is open to all students who have had introductory psychology.
Kemler Nelson.

44. Psychology of Women.

An examination of traditional and revisionist theories and research on gender roles and gender differences. The socialization of gender

roles in adults and children will be studied, with particular emphasis on the penalties that adults incur for gender-role deviance. Other topics include men's and women's marital and family roles; and gender roles and mental health.
Fall semester. Marecek.

48. Perceptual Development.

Explores the perceptual world of the infant and child in order to assess the impact of experience on our ability to obtain knowledge through perception. Research on the early perception of objects, space and motion, as well as event and social perception, will be considered against the backdrop of major theoretical controversies. Students will have the opportunity to devote much of their effort in the course to preparing a substantial paper on a topic of their choice. Some knowledge of development and/or perception may be helpful, but is *not* prerequisite.
Kellman.

52. Representations of Women's Identity.

(See English 82). Satisfies distribution requirement in group 2 *not* group 3.
Not offered 1985-86.

56. Moral Thinking.

An investigation into the role played by cognitive dimensions in influencing moral, linguistic, and political behavior, with emphasis on adolescence and beyond. An attempt is made to place the investigation within a framework provided by current trends in cognitive psychology, existential philosophy and linguistics and to draw on the implications of these dimensions with respect to the relationship of the individual to the nation-state and the international system. (Cross-listed as Linguistics 56.)
Not offered 1985-86. Bloom.

60. Language Acquisition.

An examination of the process by which children learn their first language. Stages in the acquisition of phonology, syntax, and semantics; language acquisition and universal grammar; the issue of biological specialization for language.
Prerequisite: Linguistics 1 preferred, but this requirement may be met through additional reading. Crosslisted as Linguistics 60.
Not offered 1985-86. Linebarger.

61. Psycholinguistic Approaches to Aphasia.

See Linguistics 61.
Fall semester. Linebarger.

62. The Construction of Psychological Theory.

How are psychological theories created, constructed, and sustained? What limits are there to psychological understanding? This course explores various social, aesthetic, and ideological factors that enter into the process of theory construction. Special attention is also given to the linguistic and literary conventions that govern interpretations of human action.
Prerequisite: Introductory Psychology and at least one additional course in psychology.
Fall semester. Gergen.

63. Special Topics in Cognitive Psychology.

Selected problems from the current literature on human information processing and cognitive psychology are considered in detail. Emphasis is placed on the relationship between theories of cognition and current experimental findings. Also, the development of cognitive skills receives attention.
Kemler Nelson.

64. Modes of Psychotherapy.

A survey of the theories, practices, and goals of various modes of psychotherapy, including psychodynamic approaches, behavior therapy, humanistic therapies, cognitive therapy, and family therapy. Other topics include research on the effects of psychotherapy, the ethics and politics of psychotherapy, and definitions of mental health.
Spring semester. Marecek.

65. Political Psychology.

A psychological examination of individuals' participation in and impact upon politics and the effect of various political systems on individuals. Personality differences and psychological processes are examined both for political leaders and for the general public. Topics thus include psychobiographies of presidents and other leaders; psychological distortion in political decisions; personality types among the public; psychological factors in public opinion and revolution. Projects may

involve class or individual research.(Cross-listed as Political Science 65.)
Not offered 1985-86. Peabody.

67. Special Topics in Child Development.

Aspects of personality, social, and cognitive development are examined, with individual and group field projects an important part of the course.

68. Special Topics in Social Psychology.

Considers special topics in human relations.

69. Special Topics in Personality.

Considers selected topics in personality organization and dynamics.

86. Topics in Philosophy and Psychology.

This course treats in detail selected topics that have been separately explored within both philosophy and psychology. The aim is to combine research efforts from the two disciplines and develop a more complete and coherent understanding of the topics than has been possible within either discipline alone.
Prerequisites: Open to advanced students in either philosophy or psychology who have had at least one course in each department. Cross-listed as Philosophy 86.
Fall semester. Schwartz and Lacey.

87. Colloquium: Psychology, Biology and Economic Rationality.

The concept of "economic man," in rational pursuit of self-interest, has had a profound impact on theory and research throughout the social sciences in the last two centuries. This course will offer a critical examination of the notion of economic rationality, exploring the role it plays in economics, in evolutionary biology (sociobiology), and in psychology. The implications of this notion for thinking about morality and about social organization will also be considered. The course will be taught in seminar format, for two credits.
Prerequisites: The course is open, by application, to advanced students in either biology, economics, philosophy, or psychology.
Schwartz.

90. Practicum in Clinical Psychology.

An opportunity for advanced psychology students to gain supervised experience working in off-campus research projects or clinical settings. Weekly discussions are held concerning practical, theoretical, and ethical issues arising from participants' experiences. Course requirements and evaluations are tailored to individual projects. Advance arrangements for placements should be made in consultation with the instructor.

91. Research Practicum in Physiological Psychology.

Research on the neural and chemical bases of learning and memory. Current theories are discussed. Special topics include: interhemispheric transfer, memory consolidation, and recovery from retrograde amnesia. Laboratory work is designed to introduce students to techniques in physiological psychology.
Prerequisite: Psychology 30. By application.
Fall semester. Schneider.

94. Independent Research.

Students conduct independent research projects. They typically study problems with which they are already familiar from their course work. Students must submit a written report of their work. Registration for Independent Research requires the sponsorship of a faculty member who agrees to supervise the work.
Each semester. Staff.

95. Tutorial.

Any student may, with the consent of a member of the department, work under a tutorial arrangement for a single semester. The student is thus allowed to select a topic of particular interest, and in consultation with a faculty member, prepare a reading list and work plan. Tutorial work may include field research outside Swarthmore.
Each semester. Staff.

96, 97. Senior Paper.

With the permission of the Department, students may conduct a 2-credit research project in their senior year as one way to meet the comprehensive requirement. The course includes: (a) carrying out a research project with the advice of a faculty sponsor and (b) taking part in a joint discussion group that shares the problems of each stage of the research. Students should develop a general plan by the end of the junior year and apply for departmental approval. By application.
Both semesters. Staff.

98. History and Systems of Psychology. Intended to provide integration of different fields of psychology and to offer majors one way to meet the comprehensive requirement. Historical treatment concentrates on the major systematic points of view. Special consideration is given to problems overlapping several areas of psychology. Usually offered in the Spring semester, in 1985-86 it will be given in the Fall term.
Fall semester. Peabody.

SEMINARS

104. Individual in Society. An analysis of the relationship between people and their society. Basic social processes are discussed, including the understanding of other persons, theories of cognitive consistency, group influence and conformity. Applications to political attitudes, group prejudices, the relation of attitudes and personality, and the relation of psychology to the social sciences are also considered. Two credits.
Not offered 1985-86. Peabody.

105. Personality. An exploration of general theories of human functioning from Freud to the present. Special attention is given to the empirical, intellectual, ideological, and pragmatic basis of competing theoretical perspectives. Two credits.
Spring semester, 1986. Gergen.

107. Language and Thought.
See Linguistics 107.
Fall semester. Bloom.

109. Physiological Psychology. An analysis of the neural bases of motivation, emotion, learning, memory and language. Generalizations derived from neurobehavioral relations will be brought to bear on clinical issues. Two credits.
Spring semester. Schneider.

118. Philosophy of Psychology.
See Philosophy 118.
Not offered 1985-86. Lacey.

131a and b. Learning and Behavior Theory. See description of Psychology 31. Students are expected to attend lectures given in Psychology 31, and to participate in the laboratory. The second part of the seminar (131b) considers in depth special topics of interest discussed in the first part of the seminar. One credit each semester.
131a: *Fall semester, 1985.*
131b: *Spring semester, 1986.* Schwartz.

132a. and b. Perception. Psychology 132a meets with Psychology 32. The second part of the seminar (132b) explores selected topics in human perception. Major theories and experimental data direct our exploration of the roles of inborn mechanisms and inferential processes in producing perceptual experience. Adult visual perception of form, space, motion and their interrelations are major concerns. Intersensory coordination, some auditory perception and perceptual adaptation are also considered. One credit each semester.
Both semesters. Kellman.

133a and b. Cognitive Psychology. Psychology 133a meets with Psychology 33. The second part of the seminar (133b) is an intensive study of higher mental processes. Specific topics include mental representation, memory organization, imagery, attention and consciousness, concept formation, reading, thinking, and problem-solving. One credit each semester.
Both semesters. Kellman.

138. Abnormal Psychology. A study in depth of various theoretical perspectives on psychological disorders, including schizophrenia, autism, depression, and anxiety disorders. Underlying assumptions of each theory will be considered, as well as empirical evidence supporting the theory. Approaches to treatment will also be studied. Two credits.
Fall semester. Marecek.

139a and b. Child Development.
See description of Psychology 39. Students are expected to attend and take part in Psychology 39. The second part of the seminar (139b) considers in depth special topics of interest discussed in the first part of the seminar. One credit each semester.
Both semesters. Kemler Nelson.

180. Thesis.
May be presented as a substitute for one seminar provided some member of the Department is available to undertake the direction of the thesis. May be taken either as a 2-credit, 1-semester course or as a 2-semester course for one credit each semester. Students writing a thesis are expected to attend the weekly meetings of senior paper students during the semester(s) they are enrolled for Thesis.
Each semester. All members of the Department.

Public Policy

Coordinator: **RICHARD L. RUBIN**

The concentration in Public Policy enables students to combine work in several departments toward both critical and practical understanding of sectors of public policy, such as social welfare, health, energy, food and agriculture, and national defense. The focus of the courses in the concentration is on the development, formulation, implementation, and evaluation of policy. The departments centrally concerned with the concentration are Political Science, Economics, and Engineering; but work in other departments is decidedly pertinent to the concentration. Faculty members from other departments may be directly involved in the concentration, and course or seminar offerings from other departments may, in certain circumstances, meet requirements for the concentration. Some competence in formal or quantitative methods is required for students concentrating in Public Policy, but work in the concentration equally emphasizes historical, institutional, and normative analysis.

REQUIREMENTS AND RECOMMENDATIONS

The concentration in Public Policy is not a major. It may be taken together with a Course or External Examination (Honors) major in any field, and it can be combined most integrally with a major in one or more of the participating departments of Political Science, Economics, or Engineering. At a minimum, the concentration consists of certain course requirements, totaling six credits (some of which are also counted toward one's department major), and an internship. The program of each concentrator should be worked out in consultation with the Coordinator of the Public Policy Program and approved by the Coordinator, preferably at the same time as majors in the Course and Honors Programs are planned, but not later than the middle of one's junior year.

Academic requirements for the concentration cover three basic areas: (1) economic analysis, (2) political analysis, and (3) quantitative analysis. These may normally be met by preparation in specified courses. The economic analysis requirement can be met by Ecomonics 20 (Economics Theory) or Economics 22 (Public Finance). The political analysis requirement can be met by Political Science 50 (Public Law and Public Administration) or Political Science 51 (Topics in Public Administration and Policy) or its equivalent. The quantitative analysis requirement can be met by Mathematics 1 (Statistics for Observational Data), or Mathematics 2 (Statistics for Experimental Data), Economics 4 (Statistics for Economists), Engineering/Economics 57 (Operations Research), or Economics 108 (Econometrics). Equivalent honors courses may be substituted for any of the above.

In addition to the three preparatory or prerequisite courses, three credits must be taken from among the substantitive policy courses listed below. These courses deal with substantive sectors and institutional aspects of public policy analysis. Many of the courses will be offered for one credit and all concentrators have to take one of these three credits in a jointly taught course or seminar. The jointly taught courses, taught by faculty members from two different departments, can be taken for single or double credit and only those seminars or courses approved for double credit may be taken as units in the External Examination program.

Students interested in the more international aspects of public policy may request an alternative set of preparatory or prerequisite courses.

In special circumstances, students with adequate and appropriate alternative preparation (as might be the case for some natural science students or those with work done at other institutions) may request that such preparation be substituted for courses normally required in the concentration. Approval of such requests, as for approval of internships, will be the responsibility of the coordinator and the committee on public policy studies.

INTERNSHIP

Some direct experience or practical responsibility in the field, through work in a public, private, or voluntary agency, is required for graduation with a concentration in public policy. This requirement may be met by completing an internship during either a semester or a summer or both. Normally, students will hold internships between their junior and senior years. The internship program is supervised by the faculty member serving as coordinator of the concentration, and specific opportunities may be worked out for the students.

PROGRAM IN FOOD SYSTEMS AND FOOD POLICY

The College has a program in the area of food systems and food policy which may be of special interest to public policy concentrators as well as majors in fields of science. Under its aegis, and with support from the W. K. Kellogg Foundation, students are eligible for support for summer internships and for travel expenses related to research. The program also supports courses and components of courses in various departments including biology, economics, engineering, history, political science, religion, and sociology-anthropology. Students should contact Professor Raymond F. Hopkins, Director, for more information about the program's resources and opportunities.

ELIGIBILITY

The concentration is open to students majoring in any field, although students in the social and natural sciences are likely to be able to meet the requirements most readily. Any student with acceptable preparation is welcome to undertake work in a public policy course, subject to the priority for concentrators. For students concentrating in Public Policy and reading for Honors, certain work in the concentration will normally be eligible for external examination.

Policy Courses Offered

Economics 24.
Economics of Industry.

Economics 27.
Government Regulation of Industry.

Political Science 41.
Defense Policy.

Economics 41.
Urban Economics & Public Policy.

Economics/Political Science 42.
Health Policy.

Political Science 43.
Food Policy.

Political Science 44.
Race, Ethnicity and Public Policy.

Political Science 53c.
Presidential Politics.

Engineering/Political Science 66.
Energy Policy.

Economics/Political Science 67.
Social Insurance and Welfare Policy.

Engineering/Political Science 68.
Environmental Policy.

Economics 91/Political Science 69.
Macroeconomic Policy.

Religion

J. WILLIAM FROST, Professor and Director of the Friends Historical Library[2]
VINCENT HARDING, Visiting Lang Professor
DONALD K. SWEARER, Professor[3]
P. LINWOOD URBAN, JR., Professor and Chair
AMY-JILL LEVINE, Assistant Professor
VIVIAN-LEE NYITRAY, Instructor
LEILA BERNER, Lecturer[4]
MICHAEL A. SELLS, Lecturer[4]

Religion as a field of study encompasses historical religious traditions and varied dimensions of human experience on social and personal levels evidenced at all times and in all forms of human society. Because of the diverse and pervasive nature of religion, several methodologies have evolved for its study, including the skills of historical investigation, textual criticism, philosophical analysis, and empirical description. Added to these skills is the important ingredient of empathy toward the claims religious persons make regarding what they have perceived to be ultimately real. Focus for the several methodologies is provided by dividing the subject matter into two broad areas: the Religious Traditions of the West, and the Religious Traditions of Asia.

Any course numbered 1 through 9 may be taken as introductory to other courses in the Department. Successful completion of one of these courses is normally required for admission to courses numbered 10 and above. The normal prerequisite for religion as a Course major, or an External Examination major or minor, is completion of two courses.

The major in Religion is planned through consultation with faculty members in the Department. Majors in both the Course and the External Examination Programs select an area of concentration—either Religious Traditions of the West or Religious Traditions of Asia—but also do some work in the other area. For advanced work in some areas of religion, foreign language facility is desirable.

An important part of the Course major is the production of a sustained piece of writing. Normally, students in the Course program will elect the Senior Comprehensive Paper. However, with the consent of the Department, students may substitute a two-credit Thesis.

1. Patterns of Western Religions.

An investigation of the religious teaching and practice of the Jewish, Catholic, and Protestant traditions. Both classical and contemporary sources will be studied. There will be occasional guest lecturers, and visits to synagogues and churches.
Not offered 1985-86.

2. Patterns of Asian Religions.

An introduction to the study of religion through an examination of selected teachings and practices of the religious traditions of India and China structured as patterns of religious life. Material is taken primarily from Hinduism and Buddhism in India, and Confucianism and Taoism in China.
Fall semester. Nyitray.

3. Introduction to the Hebrew Scriptures.

A comprehensive introduction to the history of ancient Israel and Biblical Judaism as know primarily, although not exclusively, through the literature produced and preserved by those communities. Special attention will be given to the cultural contexts, both national and international, in which the texts were composed, and to the various approaches—historical, literary, sociological, etc.—by which the texts have been interpreted.
Fall semester. Levine.

4. Introduction to Christian Scriptures.

This course examines the New Testament writings in their historical and cultural con-

2 Absent on leave, spring semester, 1986.
3 Absent on leave, 1985-86.
4 Fall semester, 1985.

texts, introduces the tools—from the historical critical method to newer disciplines such as rhetorical criticism and sociological analysis—employed to discover the original meaning(s) of the documents, and investigates the continuities and the transformations of Christianity from Jewish sect to independent religion.
Spring semester. Levine.

5. Problems of Religious Thought.

The purpose of this course is to study various answers to the chief religious problems of the twentieth century. Problems include: the nature of religious experience, the existence of God, religion and morality, science and religion, and the problem of evil. Answers include those given by Martin Buber, William James, Reinhold Niebuhr, Paul Tillich, and others. Students are encouraged to find their own answers and to work out their own religious beliefs.
Each semester. Urban.

6. War and Peace.

An analysis of the moral issues posed by war, with consideration of the arguments for holy wars, just wars, defensive wars, pacifism, and the sanctity of life. The study of America's wars from the Revolution to Vietnam will show our nation's responses to organized violence.
Fall semester. Frost.

7. Introduction to Classical Judaism.

A survey of the varieties of institutional structures and beliefs of Judaism from the encounter with Hellenism to the codification of the Talmud. Particular attention is paid to the struggle between ancient tradition and cultural adaptation, the diversity of pre- and non-Rabbinic Judaisms (e.g., Diaspora accommodations, the writers of the Dead Sea Scrolls and the Pseudepigrapha), the formation of the Biblical canon, Targumim, Midrash, and Mishnah, the distinctions between orthodoxy and heresy, and the political and social factors in which this history took shape.
Spring semester. Levin.

8. Introduction to Islam.

The development of Islam from the time of Muhammad to the present day. Special attention is paid to the varied aspects of Islamic cultures; philosophy, theology, mysticism, and the world views of the poets; contemporary Islamic society viewed through novels and essays.
Fall semester. Sells.

10. The Hindu Tradition.

An analysis of the Hindu religious tradition structured around the classical paths of action *(karma)*, knowledge *(jnana)*, and devotion *(bhakti)*. The course includes analyses of various mythic, poetic, and didactic texts, selected rituals, representative institutions, and symbolic expressions in art and architecture.
Not offered 1985-86. Swearer.

11. The Buddhist Tradition.

A study of selected facets of the worldviews of the three major schools of Asian Buddhism (Theravada, Mahayana, Vajrayana). The course includes analyses of various mythic, poetic, and didactic texts, selected rituals, representative institutions, and symbolic expressions in art and architecture.
Spring semester. Nyitray.

12. Religious Autobiography.

Autobiography as a genre of religious literature and as a way of understanding the religious experience of persons. Autobiographies to be read include those of Apuleius, Augustine, Matsuo Basho, Frederick Douglass, Ghandi, Dag Hammarskjold, C.S. Lewis, Malcolm X, Thomas Merton, Jack Rogers, Anne Sexton, Mary McD. Shideler '38, Tom Skinner, Teresa of Avila, Elie Wiesel.
Spring semester. Nyitray.

13. Comparative Religious Mysticism.

Mysticism is studied as a distinctive phenomenon within the religious traditions of Asia and the West. The writings of particular mystics, e.g., Eckhart, the Baal-shem, al Din Rumi, Ramakrishna, are studied and such problems as mystic states of consciousness, language and mysticism, the mystic and traditional religious authority, mysticism and community are explored.
Not offered 1985-86. Swearer.

14. Philosophy of Religion.

An investigation of the nature of religious faith, the problem of religious knowledge, concepts of deity, the problem of evil, and the relationship of religion to ethics. Both critics and supporters of traditional religious perspectives will be studied. (Cross-listed as Philosophy 16.)
Not offered 1985-86..

16. The Apostolic Age.

An investigation of the origin and expansion of the Christian Church from the later writings of the New Testament until the Edict of Constantine, this course explores through the use of primary sources several key transition points in Christian history, including competition with Judaism, post-canonical developments of legend and doctrine, the causes of and responses to persecution, Gnosticism, asceticism, the position of women in the Church, and the distinctions between orthodoxy and heresy.
Not offered 1985-86. Levine.

17. History of Religion in America.

An examination of religious ideas and practices of Americans from the 17th until the 20th century. Particular emphasis is placed upon the effects of religious pluralism, immigrant churches, the challenge of Darwinism, and the relation between the church and reform movements from Puritanism to Progressivism.
Not offered 1985-86. Frost.

18. Quakerism.

The history of the distinctive religious and social ideas of the Friends from the time of George Fox until the present. Particular attention is paid to differences in the development of Quakerism in England and America.
Not offered 1985-86.

19. Existentialism and Religious Belief.

A study of one of the most influential philosophical movements of the twentieth century and its impact on religious thought. Amongst philosophers attention is given to the writings of Edmund Husserl, Martin Heidegger, and Jean-Paul Sartre. Amongst religious thinkers the writings of Rudolf Bultmann, John Macquarrie, Karl Rahner, and Paul Tillich are read.
Not offered 1985-86. Urban.

21. Judaism Confronts Modernity.

Topics include: the political emancipation of western European Jewry, American Jewish religious movements as they confront issues such as "tradition" vs. religious innovation, assimilation vs. religious and cultural particularism. The challenge of the Holocaust and its effect on Jewish faith and life, Zionism, and the significance of the State of Israel will also be considered.
Fall semester. Berner.

23. Religious and Spiritual Groups in Modern America.

An examination of selected religious groups in modern America which stand outside the Jewish and Christian mainstream. Groups studied will include Theosophy, Western Vedanta, American Buddhism, and Syncretistic Christianity. Analysis of their teachings and practices, reasons for their development and appeal, their relationship to American religion and culture. The course will include fieldwork with groups in the Philadelphia area.
Not offered 1985-86. Swearer.

24. Martin Luther King, Jr. and the Black Struggle for Freedom in America, 1945-1985.

The focus of the course will be on the creative and dialectical relationship between the life and work of Martin Luther King, Jr. and the development of the modern Black Freedom Movement in the U.S.A. The work will include a serious attempt to understand the continuing significance of King for the life of the nation.

26. Women and Religion in the West.

This course will focus on: (1) a study of material about women from the biblical to the modern; (2) traditional interpretations of these texts, with attention to the concepts of patriarchalism and sexuality; and (3) an examination of this material as a means to recovering women's religious history.
Fall semester. Levine.

29. Religious Belief and Moral Action.

An examination of the relationship between religion and morality. Basic moral concepts of several religious traditions (e.g., Buddhism, Christianity, and Judaism) will be studied and compared. The relationship of moral teachings to the cosmological and theological framework in which they occur will be discussed. The course will analyze concepts of virtue and moral reasoning, the religious view of what it means to be a moral person, and the religious evaluation of particular ethical issues, e.g., social justice, ecology, sexuality.
Not offered 1985-86. Swearer.

30. Religion as a Cultural Institution.

See Sociology and Anthropology 30.

31. Confucian Traditions in China, Korea, and Japan.

The Sage, the Scholar, and the Samurai—a

study of the development of Confucianism in China and its impact on Korea and Japan. Discussion will focus on the unity of knowledge and action, and the cultivation of self-knowledge as a religious goal. Readings include selections from primary texts: poetry, essays, and diaries.
Fall semester. Nyitray.

32. Religion in East Asia.
The major religous traditions of East Asia studied against the social and cultural background of Japan. Particular attention is given to the appropriation and later development of classical Chinese Buddhist, Confucian, and Taoist traditions; religion, nationalism, and state Shinto; religion and modes of Japanese aesthetics; and the development of new religions in the 20th Century.
Not offered 1985-86. Swearer.

33. The Reformation.
A study of the Reformation in Western Europe from 1500 until 1688, its history and thought, focusing not only upon Luther, Calvin, and the Anabaptists, but also upon Trent and the Anglican Settlement. Students will be encouraged to assess the relevance of the Reformation for today.
Not offered 1985-86. Urban.

34. Religion in the 19th Century.
What were the effects in religious thought and sensibility of new ways of understanding history, society, nature, and the psyche that developed in the nineteenth century? Representative figures, such as Schleiermacher, Newman, Arnold, Emerson, Khomyakov, Troeltsch, Schweitzer, and the development of distinctive schools of thought within Judaism, are considered in some detail.
Not offered 1985-86.

35. Formation of Christian Doctrine.
A study of the formation and classical expression of the doctrines of the Trinity, Incarnation, Atonement, Original Sin, and the Sacraments as found in Scripture and the Early and Medieval Church. Toward the end of the semester students are given the opportunity to expound and evaluate the views of 19th and 20th century thinkers on these major themes. Such thinkers could include: K. Barth, M. Buber, R. Bultmann, K. Rahner, F. Schleiermacher, and P. Tillich.
Fall semester. Urban.

37. Faith and Reason in the Middle Ages.
A study of the interaction between religious faith and philosophical inquiry from Augustine to the 15th Century. Attention is paid to specific problems such as the nature and existence of God, providence, analogy, and universals and to outstanding thinkers such as Anselm, Aquinas, and Ockham. Although the primary emphasis is historical, attention is given to the contemporary relevance of medieval thought.
Not offered 1985-86. Urban.

38. Roots of the Black Freedom Movement in the U.S.A., 1865-1955.
This course will attempt to explore some of the great variety of ways in which Black people in the U.S.A. organized their lives and institutions to carry on their struggle for freedom, justice, and new, more humane society in the post-Civil War period. The role of Black religion in that struggle will receive significant attention. (The course is designed for students who have had previous work in 19th and/or 20th century American and/or Afro-American History.)
Spring semester. Harding.

39. Chinese Religious Texts.
Spring semester. Nyitray.

41. Issues in Biology and Religion.
(See Biology 41)

59. Catholic Social Thought.
(See Philosophy 59/Political Science 59)

93. Directed Reading.
Staff.

95. Tutorial.
Staff.

96. Thesis.
Majors in Course may, with Departmental permission, write a two-credit thesis.

97. Senior Paper.
Senior majors in Course will normally write a one-credit paper as the major part of their comprehensive requirement.
Spring semester. Staff.

Courses offered occasionally:

Religion and Literature
Monasticism East and West
Psychology and Religious Experience

PREPARATION FOR EXTERNAL EXAMINATIONS

The Department will arrange External Examinations in the following areas, to be prepared for in the ways indicated.

Preparation by seminar:

Religious Perspectives East and West (Seminar: 101).

An examination of the nature and structure of religious systems through the study of seminal thinkers or schools of thought as they influenced and were shaped by the traditions of which they were a part. Thinkers considered include Nagarjuna, Shankara, Ramanuja, Thomas Aquinas, Spinoza, and Kierkegaard. (This paper is required of all students declaring a Religion Major in their External Examination Program.)
Spring semester. Urban.

Christianity and Classical Culture (Seminar: 102).

A study of the development of Christian thought and institutions to the fifth century in the context of Greco-Roman religion and society. Readings in Lucretius, Apuleius, Plutarch, and Hellenistic religious texts, in Philo and the Dead Sea Scrolls, and in early Christian writers such as Justin Martyr, Tertullian, Origen, Athanasius, Ambrose, Augustine.
Spring semester. Levine.

Asian Religious Thought (Seminar: 103).

A study of seminal writings in India and China which have had a decisive influence on the religious traditions of these two cultures. The traditions considered are: Vedanta, Samkhya-Yoga, Mahayana Buddhism, Confucianism, and Taoism.
Not offered 1985-86. Swearer.

Religion in Southeast Asia (Seminar: 104).

An analysis of Theravada Buddhism as a part of the cultural traditions of Sri Lanka, Burma, and Thailand. The seminar is structured in terms of three different contexts: national, village, and urban. The themes dominating these contexts are national integration, syncretism, and modernization.
Not offered 1985-86. Swearer.

Religion and Society (Seminar: 105).

An examination of the interaction between religious values and institutions and society in different cultural contexts and time periods. Major concentration on the English Civil War, late nineteenth-century Africa, and modern America. Topics include patterns of conversion, millennialism, personal and corporate ethics, rituals, and theology.
Not offered 1985-86. Frost.

Contemporary Religious Thought (Seminar: 106).

Representative thinkers and schools of thought in the present century. These include Karl Barth, Martin Buber, Rudolph Bultmann, Karl Rahner, Paul Tillich, and A.N. Whitehead.
Fall semester. Urban.

Liberation Theology (Seminar: 107).

A study of the principal themes of liberation theology as it has developed in Latin America during recent decades; the preferential option for the poor, the relationship between salvation and political liberation, the Biblical critique of injustice, faith and politics, the role of social analysis in theological discourse, views concerning the Church, Christology and spirituality, and the conception of theology as a critical reflection on liberating practices made from the stance of participation in such practices. Readings will be drawn from such Latin American theologians as Boff, Gutierrez, and Segundo. Attention will also be given to the relationship of liberation theology to the Roman Catholic tradition, to the social and political movements which it has influenced, and to its critics.
Spring semester. Lacey.

Preparation by combinations of courses:

Buddhism
The Buddhist Tradition (Swearer)
Religion in East Asia (Swearer)

Apostolic Faith and Apostolic Tradition
The Apostolic Age (Henry)
Formation of Christian Doctrine (Urban)

Christian Thought to Aquinas
Formation of Christian Doctrine (Urban)
Faith and Reason in the Middle Ages (Urban)

Christian Thought – Augustine to the Enlightenment
Faith and Reason in the Middle Ages (Urban)
The Reformation (Urban)

The Protestant Traditions
The Reformation (Urban)
History of Religion in America (Frost)

Preparation by course and attachment:

Indian Religion
The Hindu Tradition (Swearer)

Classical Jewish Thought
Introduction to Classical Judaism (Levine)

Philosophy of Religion
Philosophy of Religion (Urban)

Preparation by Thesis:

Students who declare a major in Religion in their External Examination Program may, with permission of the Department, offer a thesis as one of their External Examination papers.

COURSES COMPLEMENTING RELIGION OFFERINGS AT SWARTHMORE

BRYN MAWR COLLEGE:

001. Elementary Hebrew (Rabeeya)

101. Readings in Hebrew Bible: Genesis (Rabeeya)

104. History and Literature of Judaism I (Lachs)

105. History and Literature of Judaism II (Lachs)

201. Topics in Biblical Literature: Apocrypha and Pseudepigrapha (Lachs)

203. Readings in Hebrew Bible: The Five Scrolls (Rabeeya)

215. Jewish Law and Folklore: The Life Cycle (Lachs)

216. Jewish Law and Folklore: The Calendar Cycle (Lachs)

304. Post-Biblical Hebrew (Rabeeya)

HAVERFORD COLLEGE:

215. Modern Critics of Christianity (Thiemann)

261. Letters of Paul (McGuire)

276. Sufism (Sells)

310. Life and Theology of Martin Luther (Luman)

Sociology and Anthropology

JENNIE KEITH, Professor
ASMAROM LEGESSE, Professor
STEVEN I. PIKER, Professor and Chair
BRAULIO MUÑOZ, Associate Professor[1]
JOY CHARLTON, Assistant Professor
ROBIN E. WAGNER-PACIFICI, Assistant Professor
A. ENDRE NYERGES, Lecturer

The program of this department emphasizes that Sociology and Anthropology are engaged in a common intellectual task. Studies in the Department are directed toward understanding the order, meaning, and coherence of life in human societies and cultures. Toward this end, courses in the department variously emphasize the comparative study of societies and cultures; the conditions of social organization as well as disorganization; the bases of human adaptation; change as well as continuity as ubiquitous features of the human condition; gender culture; and meaning and culture. Emphasis will also be placed on the relevance of Sociology and Anthropology to the study of modern and, particularly, American society, and to the social problems of the modern age. In addition to emphasis on the important mutuality of Sociology and Anthropology, members of the department are variously committed to exploring the mutuality between Sociology and Anthropology and neighboring disciplines, such as Religion, Psychology and Linguistics, Philosophy, Literature, Biology, History, and the other social sciences.

REQUIREMENTS AND RECOMMENDATIONS

Courses numbered 1 through 12, as well as 24, may serve as points of entry for students wishing to begin work in the department. Enrollment in these courses is unrestricted, and completion of one of them will normally serve as prerequisite to all other work in the department (Course 30 may, however, with permission of the instructor, be taken without prerequisite.)

Applicants for major will normally be expected to have completed at least two courses in the department. Course majors will complete a minimum of eight units of work in the Department, including a double-credit thesis tutorial to be taken during the fall and spring semesters of the senior year, as well as course 50. Majors in the external examination program are also required to complete course 50. Normally, majors will complete course 50 by the end of their junior years, and prospective majors are encouraged to take the course during their sophomore years.

The department emphasizes the importance of familiarity with appropriate elementary statistics as well as computer literacy, both for work taken at the College and for subsequent career development. Toward underlining this, the Department crosslists Mathematics courses 1, 2, and 23 (listed as, respectively Sociology and Anthropology 18, 19, and 20), any one of which may be taken as one of the eight units of work required for completion of a major in Sociology and Anthropology.

AREAS OF SPECIAL CONCENTRATION IN SOCIOLOGY AND ANTHROPOLOGY

Teaching and research interests of members of the Department cluster so as to create a number of subject matter areas within or between the two disciplines in which students may take a

1 Absent on leave, fall semester, 1985.

concentration of work, in course or seminar format, or both. The Department here identifies these general areas and the faculty members who work within them, and encourages interested students to meet with one or more of the indicated Department members to explore program of study possibilities.

A) Social Theory and Social Philosophy (Muñoz, Piker)
B) Human Adaptation, Cultural Ecology, and Human Evolution (Legesse, Piker)
C) Post-Industrial Society (Charlton, Keith, Wagner-Pacifici)
D) Cultural and Ethnic Pluralism (Charlton, Keith, Legesse)
E) Religion and Culture (Charlton, Piker)
F) Psychology and Culture (Charlton, Legesse, Piker)
G) Sociology of Art and Intellectual Life (Muñoz, Wagner-Pacifici)
H) Modernization and Development (Keith, Legesse)
I) Modern America (Charlton, Keith, Legesse, Wagner-Pacifici)
J) The Life Cycle (Keith, Legesse, Piker)
K) Inequality (Charlton, Legesse, Wagner-Pacifici)
L) Political Behavior and Culture (Keith, Legesse, Wagner-Pacifici)

1. Modern America: Culture, Society and State.

This course will explore central themes and points of conflict in American life: authority, community, sexuality, work, personal identity, politics, and heroism. This exploration will proceed by way of an analysis both of the institutional representations of these central issues and their cultural expressions.
Spring semester. Wagner-Pacifici.

2. Introduction to Social and Cultural Change.

The course has two themes. First, it examines how simpler societies maintain an intimate and stable relationship with the natural world, whereas modern societies are faced with major upheavals associated with rapid population growth, economic development, and ecological degradation. Second, the course focuses on social movements, prophetism, communalism, anarchism, and alienation as responses to economic and ecological crisis and as forces of social transformation. Students will participate in an ethnographic encounter session as an experiment in cross-cultural communication.
Spring semester. Legesse.

4. Community: The Human Strategy.

The process through which both the structures and the feelings of community are created, the conditions which promote or obstruct that creative process, and the consequences for the individuals who participate in it, will be examined through comparison of community formation in a variety of setting: utopias, kibbutzim, retirement villages, suburbs, mental institutions.
Spring semester. Keith.

5. Freshman Seminar: Introduction to Contemporary Social Thought.

A general introduction to major theoretical developments in the study of social life since the 19th century. Selected readings will be drawn from the work of such modern social theorists as Marx, Weber, Durkheim, Freud, and Simmel. Readings from contemporary authors such as Geertz, Goffman, Giddens, Lukes, and Rieff will also be included. These developments will be studied against the background of the socio-philosophical climate of the 19th century. Limited enrollment.
Not offered 1985-86. Muñoz.

7. Sex Roles, Power, and Identity.

An exploration of the social, political, and psychological implications of gender, drawing on socio-biological, cross-cultural, and historical materials. The primary emphasis will be placed on developments in contemporary America.
Fall semester. Charlton.

10. Human Evolution.

This course emphasizes the human condition, or culture, as a mode of adaptation to be seen in evolutionary and cross-species perspective. Topics such as communication, competition, sexuality, sociality, and intelligence are treated by extensive reference to non-human Primate as well as human materials. The course will also take up the following topics: the place of Hominids in the Order of the Primates; stages in the evolution of humankind; and the evolution of distinctively cultural systems of behavior. As regards the last, the course will give special emphasis to the evolution of language, the evolution of the family and the incest taboos, and bio-evolutionary theses on

human nature and culture. Cross-listed as Biology 10. May be used toward distribution requirements in group 4 only.
Fall semester. Piker, Williams.

18. Statistics for Observational Data.
(Cross-listed as Math 1. Please see Mathematics entry for description.)

19. Statistics for Experimental Data.
(Cross-listed as Math 2. Please see Mathematics entry for description.)

20. Statistics.
(Cross-listed as Math 23. Please see Mathematics entry for description.)

21. Research Design Colloquium.
Introduction to the process of research on human social life: creation of research questions, strategies for obtaining evidence, techniques of evaluating hypotheses, and generating theory. The roles of theory, ethical issues, and cultural and historical context in the research enterprise will be addressed. Students will design and undertake individual research projects, and members of the department will visit the class to discuss their own research experience.
Fall semester. Charlton.

24. Psychological Anthropology.
Sometimes called culture and personality, this field explores the relationship between the individual and his or her culture. The course treats the following issues: a) the psychological, or symbolic, capacities presupposed by culture; b) socialization, or the transmission of culture from generation to generation; c) the cultural distribution of personality traits; and d) culture and mental health. Case materials will be principally, but not exclusively, non-Western, and the cross-cultural study of child rearing will receive particular emphasis. (Cross-listed as Psychology 24.)
Not offered 1985-86. Piker.

25. Language, Culture, and Society.
(Cross-listed as Linguistics 25. See listing under Program in Linguistics.)
Not offered 1985-86. Charlton.

27. Afro-American Culture and Society.
Black culture is examined at several stages of its development in the twentieth century—as a culture of survival, assimilation, pan-Africanism, prophetism, nationalism, and revolution. The sociology of Black American communities is viewed in terms of the lifecycle, family structure, associational life, religious institutions, and class structure, and how these systems react to racism, urban migration, economic deprivation, and political change.
Fall semester. Legesse.

30. Religion as a Cultural Institution.
(Cross-listed as Religion 30.) The focus is primarily cross-cultural, and religion case materials will be drawn from both pre-literate and civilized traditions, including the modern West. The following topics will be emphasized: religious symbolism; religious evolution; religion as a force for both social stability and social change; psychological aspects of religious belief; and religious change in modern America, with particular emphasis on both Fundamentalism and the "cults." May be taken without prerequisites with permission of instructor.
Not offered 1985-86. Piker.

33. Ecology and Society.
Examination of different types of ecological conditions and how they influence pastoral, agricultural, peri-urban, and urban social systems. Special attention will be given to the world food crisis, to climatic change, demographic pressures, environmental degradation, and a wide range of adaptive strategies that have developed in response to ecological stress.
Not offered 1985-86. Legesse.

36. Peoples and Cultures of Africa.
An introduction to traditional and modern Africa with emphasis on representative societies from East and West Africa. The course examines pre-colonial political and social institutions, African responses to colonial domination, and the impact of urbanization and economic development during the post-colonial period.
Fall semester. Legesse.

43. Society and Culture in Spanish America.
The relationship between society and culture in Spanish America. Recent and historical developments in social stratification and ethnic relations will be considered as crucial factors underlying Spanish-American culture. Particular attention will be given to Spanish-American social thought as evidenced in social sciences

research, theology, philosophy, and literature.
Not offered 1985-86. Muñoz.

44. Social Inequality.

This course analyzes conflicting theoretical perspectives on the origins and meaning of social stratification. Empirical studies of both a historical and cross-cultural nature will be examined for the ways in which they engage alternative readings of such issues as the nature and role of class, the relationship of specific classes to each other (the issue of class boundaries), and the relationship of class to other dimensions of social stratification.
Spring semester. Wagner-Pacifici.

45. Field Studies in Primate Behavior.

An investigation of primate ethology as studied in the animal's natural environment. Particular emphasis will be placed on those studies relating social behavior to habitat or population stress. The course will include both lecture and seminar format; although there is no scheduled laboratory, students will be expected to participate in at least one field trip.
Prerequisites: Biology 2 or one introductory level course in Sociology/Anthropology giving an appropriate background in anthropology.
Not offered 1985-86. Williams.

46. Political Anthropology.

This course will utilize the comparative perspective of anthropology to study the ways in which authority is acquired and accepted as legitimate, the ways in which decisions are made or avoided, and the ways in which conflict is defined, mediated, and resolved or extended. Subject matter will include political communities in various cultural contexts and at various levels of social and technological complexity.
Not offered 1985-86. Keith.

47. Education and Society.

(Cross-listed with Educ. 47.) This course will explore the social and cultural functions and consequences of formal and informal education in both Western and non-Western societies. Modes of intended and unintended socialization within the school and outside will be examined. A range of factors which can promote or inhibit learning will be explored and linked to educational performance. Topics include: school as an agent of social mobility and its relationship with the community; the school as a social system and the dynamics of classroom life; and the behavioral and academic outcomes of curricular innovation. Students will be required to conduct weekly field work in an educational setting.
Not offered 1985-86.

48. Modern Organizations.

A study of the formal and informal structure of modern, complex organizations. Special attention will be paid to social composition, internal dynamics, social control, decision-making, power and politics. Case examples from a variety of settings—business, medical, religious, political—will be examined in light of classical and contemporary theory and research in organizational analysis.
Spring semester. Charlton.

49. The Meaning of Work: Sociology of Occupations and Professions.

This course will take up theory and research pertaining to the social organization of work and the meaning of work experience in modern societies. Among the topics to be discussed are classic statments on the division of labor, theories of "post-industrial" society, occupational structure, labor market stratification, occupational choice and recruitment, occupational socialization, ideology and identity, career patterns, work and social relationships, work and family. Particular case studies will include various types of blue and pink collar work, business and the corporate world, professions and semi-professions.
Spring semester. Charlton.

50. Intellectual Foundations of Contemporary Sociology and Anthropology.

Examination of fundamental and recurrent theoretical issues in sociology and anthropology, from the perspective of intellectual history. This course will normally be taken by Course majors during their junior year. It is open to non-majors, though freshman and sophomores must have permission of the Department chairman.
Spring semester. Muñoz, Piker.

51. An Introduction to Archaeology.

(See listing under Department of Classics.)

55. Age in Society.

The course will examine age from a cross-cultural perspective with the goal of distin-

guishing universal aspects of the aging process from the diverse effects of social and cultural context on roles of old and young people and the use of age as a principle of group definition. Specific problems will include relations between generations, political organization of older people, and the role of older people in the family and the household.
Fall semester. Keith.

56. Urban Anthropology.

Cross-cultural, comparative study of social life in cities, with particular emphasis on bases and strategies of group formation and maintenance, e.g., kinship, ethnicity, friendship, residential separation, ritual. Readings represent a wide range of societies both geographically and culturally; and all students in the course will do a field work project.
Not offered 1985-86. Keith.

60. Spanish American Society Through Its Novel.

(Also listed as SAL 60—see Modern Languages.) This course will explore the relationship between society and the novel in Spanish America. Selected works by Carlos Fuentes, Mario Vargas Llosa, Gabriel Garcia Marquez, Miguel Angel Asturias and others will be discussed in conjunction with sociological patterns in contemporary Spanish America.
Not offered 1985-86. Hassett and Muñoz.

63. Power, Authority, and Conflict: Legitimacy and Rebellion.

Ths course develops a comparative, sociological perspective on the issue of political legitimacy. An understanding of political legitimacy is sought via an examination of specific political movements that challenge established authority and of the responses of those who are thus challenged. The analytical approach is two-tiered: a macro-level historical comparative analysis is combined in each case with a micro-level analysis of the cultural framing of the movements and the responses.
Fall semester. Wagner-Pacifici.

66. Urban Sociology: The Social Life of Cities.

Placing the American metropolis in developmental and comparative perspective, this survey of urban life considers: classical theories of the city; issues of community lost, saved, or liberated; origins and development of cities; migration; spatial patterns; race and ethnicity; relationship of suburban to urban areas; power, politics, fiscal crisis, and public policy; the urban future.
Not offered 1985-86. Charlton.

68. Urban Education.

(See Education 68.)

80. Colloquium: Freud and Modern Social Theory.

The colloquium divides into two parts. The first part is devoted to a close reading of selected items from the Freudian canon. The second part will examine Freud's contribution to current social and cultural analysis. This semester, the colloquium will benefit from guest lectures by members of the Swarthmore faculty. Besides selected works by Freud, works by Paul Ricoeur, Philip Rieff, and Habermas will be examined.
Prerequisites: advanced work in Sociology, Philosophy, Psychology, or permission of the instructor.
Not offered 1985-86. Muñoz.

82. Colloquium: Development and Urbanization in the Third World.

An examination of the post-colonial social transformation that occurred in the Third World. This process will be considered in the context of demographic and ecological change, the green revolution, and the rural-urban exodus. The problem of urban poverty will receive special attention. Case material will be drawn from Africa, Asia, and Latin America.
Spring semester. Legesse.

83. Colloquium: Art and Society.

The course is divided into two parts. The first part examines the relationship between art and society from a sociological perspective. The second part introduces hermeneutics as a sociological method for the interpretation of art. This semester the class will examine selected works by Dostoevski and Neitzsche.
Prerequisite: permission of the instructor.
Not offered 1985-86. Muñoz.

91D. Advanced Urban Research.

Students participate in research and program development at J. F. Kennedy Community Mental Health and Mental Retardation Center affiliated with Hahnemann University in Philadelphia. Field notes on this work are turned in regularly, and class members meet periodically at Swarthmore to discuss their experiences.

Juniors and seniors with a B average who are willing to spend 1½ days per week at Hahnemann are eligible to apply. Transportation to J. F. Kennedy is paid, and credit varies with individual involvement in the program.
Fall and spring. Keith.

93. Directed Reading.
Individual or group study in fields of special interest to the students not dealt with in the regular course offerings. Consent of the chairman and of the instructor is required.
Members of the Department.

96-97. Thesis. Theses will be required of all Course majors.
Seniors in the Course program will normally take two consecutive semesters of thesis tutorial. Students are urged to discuss their thesis proposals with faculty during the spring semester of their junior year, especially if they are interested in the possibility of field work.
Members of the Department.

The following courses, with attachment, can be taken in preparation for External Examinations: S&A 30, 33, 44, 63, 80, 83.

SEMINARS

101. Critical Modern Social Theory.
This seminar will trace the development of critical modern social theory from the works of Marx to present day social theorists. Particular attention will be paid to selected works by Marx, Lukacs, Adorno, Horkheimer, Marcuse, Collotti, and Habermas.
Prerequisites: advanced work in Sociology/Anthropology, Philosophy, or Political Science; or permission of the instructor.
Not offered 1985-86. Muñoz.

102. Creation of Community.
The central question for the seminar is under what conditions community can successfully be created. Utopian experiments, squatter settlements, and institutions such as retirement residences and monasteries will be compared as examples of intentional and unintentional, planned and unplanned community creation.
Not offered 1985-86. Keith.

103. Political Anthropology.
A cross-cultural perspective on politics: the structures and processes of authority, conflict and group definition. Specific problems will include legitimation of authority, decision-making, agenda-building, expansion, containment, and resolution of conflict. Particular emphasis will be placed on symbolic aspects of politics. Readings will cover a wide range of cultures and degrees of societal complexity; in addition, each student will work intensively with ethnographic material from one traditional society.
Not offered 1985-86. Keith.

104. Nature and Culture: Convergent Perspectives.
(or Philosophical Anthropology)
This seminar draws upon a growing interdisciplinary field, the several components of which provide new and convergent perspectives on human nature and its cultural elaborations. Materials to be treated will come, most importantly, from the following areas: human evolution, linguistics, psychology, as well as a number of fields within anthropology. The main issues to be treated include: bio-evolutionary foundations of human nature; human intelligence; consciousness; human potential; the evolution of morality; and anthropological perspectives on the current human situation. In lieu of individually done seminar papers, students will work in sub-groups on issues which run through the entire seminar, and the results obtained by each sub-group will be discussed by the entire seminar. The syllabus will cover only about two-thirds of the total reading to be done by members of the seminar. The remainder wll be identified by the sub-groups as they work on their projects. Cross-listed as Linguistics 104.
Prerequisites: permission of the instructor.
Fall semester. Piker.

105. Modern Social Theory.
An analysis of selected works by the founders of modern social theory and contemporary social theorists. Works by Marx, Weber, Durkheim, and Parsons will be discussed.
Not offered 1985-86. Muñoz.

107. Religion as a Cultural Institution.
The following specific topics will be treated:

religious evolution; religion as a force for both social stability and social change; the psychological bases for religious belief. Major theories to be considered include those of Max Weber, Emile Durkheim, and Sigmund Freud. A cross-cultural perspective will be emphasized, and attention will be paid to religious change in modern America.
Spring semester. Piker.

108. Social Inequality.

This seminar analyzes conflicting theoretical perspectives on the origins and meaning of social stratification. Empirical studies of both a historical and cross-cultural nature will be examined for the ways in which they engage alternative readings of such issues as the nature and role of class, the relationship of specific classes to each other (the issue of class boundaries), and the relationship of class to other dimensions of social stratification.
Not offered 1985-86. Wagner-Pacifici.

109. Social and Cultural Change.

This seminar will examine the theories of social movements, modernization, Westernization, cultural diffusion, and stages of development as they apply to the process of social change in non-Western societies. Case studies will be drawn from China, India, Indonesia, Peru, Brazil, Mexico, Nigeria, Kenya, and South Africa.
Prerequisites: Entry-level course in Sociology/Anthropology or permission of the instructor.
Spring semester. Legesse.

110. Sociology of Occupations and Professions.

This seminar will take up theory and research pertaining to the social organization of work and the meaning of work experience in modern societies. Among the topics to be discussed are classic statements on the division of labor, of "post theories industrial" society, occupational structure, labor market stratification, occupational choice and recruitment, occupational socialization, ideology and identity, career patterns, work and social relationships, work and family. Particular case studies will include various types of blue and pink collar work, business and the corporate world, professions and semi-professions.
Spring semester. Charlton.

114. Political Sociology.

This seminar develops a comparative, sociological perspective on the issue of political legitimacy. An understanding of political legitimacy is sought via an examination of specific political movements that challenge established authority and of the responses of those who are thus challenged. The analytical approach is two-tiered: a macro-level historical comparative analysis is combined in each case with a micro-level analysis of the cultural framing of the movements and the responses.
Fall semester. Wagner-Pacifici.

115. Freud and Modern Social Theory.

The seminar divides into two parts. The first part is devoted to a close reading of selected items from the Freudian canon. The second part will examine Freud's contribution to current social and cultural analysis. Besides works by Freud, works by Ricoeur, Rieff, Habermas, and Foucault will be examined.
Prerequisites: advance work in Sociology/Anthropology, Philosophy, or Political Science; or permission of the instructor.
Not offered 1985-86. Muñoz.

117. Urban Anthropology.

Cross-cultural, comparative study of social life in cities, with particular emphasis on bases and strategies of group formation and maintenance, e.g., kinship, ethnicity, friendship, residential separation, ritual. Readings represent a wide range of societies both geographically and culturally; and all students in the seminar will do a field work project.
Not offered 1985-86. Keith.

118. Ecology and Society.

Examination of different types of ecological conditions and how they influence pastoral, cultural, peri-urban, and urban social systems. Special attention will be given to the world food crisis, to climatic change, demographic pressures, environmental degradation, and a wide range of adaptive strategies that have developed in response to ecological stress.
Not offered 1985-86. Legesse.

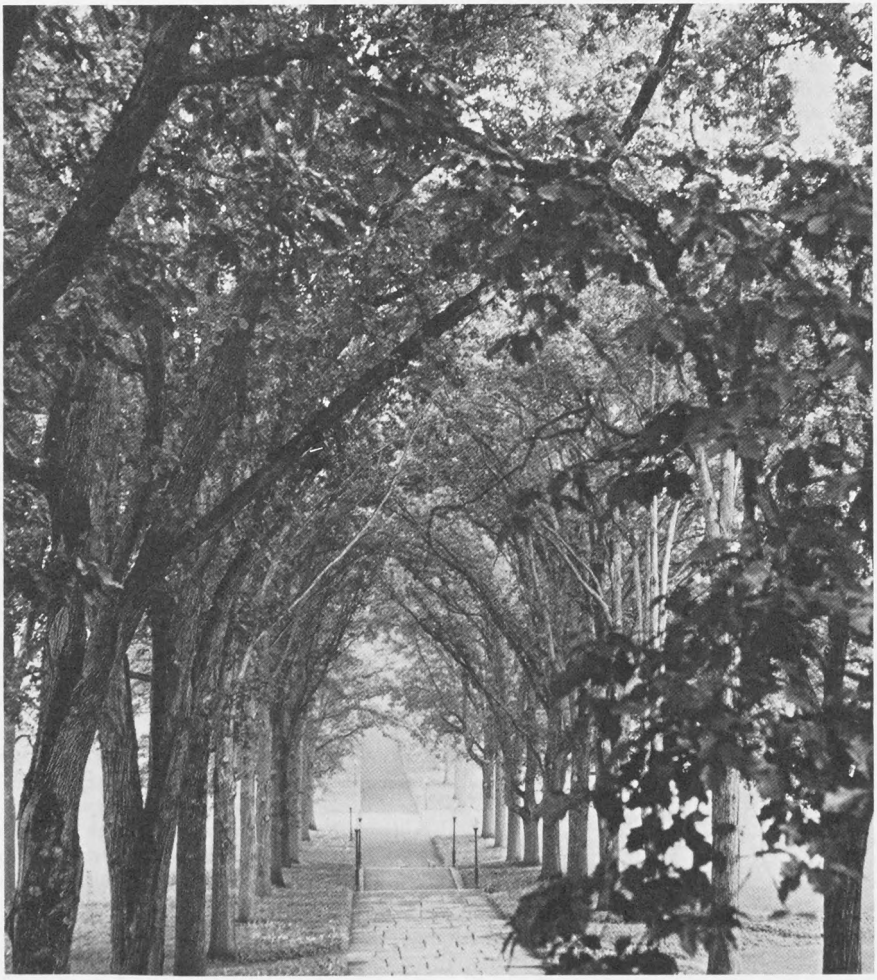
119. Age, Culture, and Society.

The social and cultural significance of age will be examined in this seminar. Generational conflicts, rites of passage, peer grouping, cultural definitions of the life course will be major topics. Case material will include East-African and Latin-American age grades, modern retirement communities, life histories from various cultures. Seminar members will also do

observation and interview projects focused on age.
Fall semester. Keith.

180. Thesis.
Honors candidates who choose to do so will customarily write theses during the senior year. Students are urged to have their thesis proposals approved as early as possible during the junior year.
Members of the Department.

VI



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The Benson East
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Clark Kerr
8300 Buckingham Drive
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Charles C. Price, III
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Swarthmore, PA 19081
Richard B. Willis
7251 Willow Road
Ambler, PA 19002
Helen Gawthrop Worth
Westmoreland, Kendal at Longwood
Kennett Square, PA 19348

Term Expires December, 1985

Maria Klemperer Aweida
7184 Spring Court
Boulder, CO 80303
Ann Lubin Buttenwieser
1080 Fifth Avenue
New York, NY 10028
*Alexander Morgan Capron
University of Southern California–Law Center
Los Angeles, CA 90089
Christopher F. Edley, Jr.
Griswold Hall, Room 208
Harvard Law School
Cambridge, MA 02138
Eugene M. Lang
912 Fifth Avenue
New York, NY 10021
*Rosita Sarnoff
23 East 11th Street
New York, NY 10003

*Nominated by the Alumni Association

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145 E. 74th Street, 11A
New York, NY 10021
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10 Kershaw Road
Wallingford, PA 19086

Jan Tarble
Box 193,
Shoshone, CA 92384
Ira Tensard Wender,
499 Park Avenue
New York, NY 10022

Term Expires December, 1986

Neil Austrian
Showtime/The Movie Channel, inc.
1633 Broadway Avenue
New York, NY 10019
Samuel Hayes, III
Harvard Business School
Soldiers Field
Boston, MA 02163
Richard Hurd
167 Wharton Lane
Bethlehem, PA 18017
*Ruth Wilcox Mahler
Millbrook Road
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Barbara Weber Mather
City Solicitor
1520 Municipal Services Building
Philadelphia, PA 19102
Marge Pearlman Scheuer
101 Central Park West
New York, NY 10023
*W. Marshall Schmidt
W. H. Newbold's Son & Co., Inc.
1500 Walnut Street
Philadelphia, PA 19102
Sue Thomas Turner
Box 121, Cook Road
Alfred Station, NY 14803

Term Expires December, 1987

Katherine Conner
635 San Marino Avenue
Bryn Mawr, PA 19010
J. Parker Hall, III
1161 Pine Street
Winnetka, IL 60093
*Stephen B. Hitchner, Jr.
7826 Glenbrook Road
Bethesda, MD 20814
Elise F. Jones
Box 326-A, R. D. #1
Newtown, PA 18940

*Carolien Powers Maynard
219 Hudson Street
Pelham Manor, NY 10803
Elizabeth J. McCormack
Rockefeller Family and Associates
30 Rockefeller Plaza, Room 5600
New York, NY 10112
Janet Hart Sylvester
6648 32nd Street, N.W.
Washington, DC 20015

Term Expires December, 1988

*Nancy Y. Bekavac
2510A-4th Street
Santa Monica, CA 90405
Frederick A. Hargadon
New York College Board
888 Seventh Avenue
New York, NY 10019

Walter Lamb
Merlin Road
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101 Bryn Mawr Avenue
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Kendal-Crosslands
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New York, NY 10021

President Designate
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6608 32nd Place NW
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Vice President, Elinor Meyer Haupt '55
138B Heritage Hills
Somers, NY 10589

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Philadelphia, PA 19131

Secretary, Lillian Frank Youman '57
752 Mancill Road
Wayne, PA 19087

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Zone A

Delaware, Pennsylvania

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Mary L. Buckman '78
31 S. Hanover Street
Carlisle, PA 17013

Jay G. Ochroch '54
901 Fox Chase Road
Jenkintown, PA 19046

Freeman L. Palmer '79
WCAU-TV
Philadelphia, PA 19131

Richard Post '36
312 Whitemarsh Valley Road
Ft. Washington, PA 19034

Lillian Frank Youman '57
752 Mancill Road
Wayne, PA 19087

1987

William C. Adamson, M.D. '40
1542 Susquehanna Road
Rydal, PA 19046

William B. Carr, Jr. '73
115 Vernon Lane
Media, PA 19063

Thomas J. Elverson '75
414 Drexel Place
Swarthmore, PA 19081

Nancy Deane Passmore '30
630 N. Lemon Street
Media, PA 19063

Mary Belin Rhodes '58
Miller Road
Waverly, PA 18471

Betty Mack Twarog '48
2601 Pennsylvania Ave., Apt. 1123
Philadelphia, PA 19130

1988

Deborah Frazer '69
606 W. Upsal Street
Philadelphia, PA 19119

Anna Rickards Sensenig '30
2609 Woodleigh Road
Havertown, PA 19083

Alan A. Symonette '76
717 Dorset Street
Philadelphia, PA 19119

Zone B

New Jersey, New York

1986

Harriet Donow Cornell '54
205 Parrott Road
West Nyack, NY 10994

Steven A. Delibert '65
3 Pierrepont Place
Brooklyn, NY 11201

1987

Katherine Buttolph '74
40 Laurel Drive
Little Silver, NJ 07739

1988

Joan Schuster Faber '60
300 Central Park West, 4F
New York, NY 10024

Frank L. Lyman, M.D. '43
68F Long Beach Boulevard
N. Beach, Beach Haven, NJ 08008

Philip L. Gilbert '48
174 Kilburn Road
Garden City, NY 11530

Laura McKnight Stabler '49
Box 213
Rocky Hill, NJ 08553

Giles K. Kemp '72
15 Paddington Road
Scarsdale, NY 10583

Zone C

Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont

1987

Lois Wright Brown '38
31 Hemlock Corner
Henniker, NH 03242

Robert E. Levien '56
28 Fresh Meadow Road
Weston, CT 06883

John C. Cratsley '63
61 Lang Street
Concord, MA 01742

Zone D

District of Columbia, Maryland, Virginia

1986

Harriet Dana Carroll '38
4802 Broad Brook Drive
Bethesda, MD 20814

Alexander Shakow '58
6608 32nd Place NW
Washington, DC 20015

1988

Robert P. Fetter '53
2923 Carolina Avenue SW
Roanoke, VA 24014

B. J. Yannet Stone '57
5615 Warwick Place
Chevy Chase, MD 20815

Zone E

Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Texas, West Virginia, Wisconsin

1986

Philip G. Hoffer '65
1217 Brooklyn Avenue
Ann Arbor, MI 48104

Katherine Leser '76
1936 N. Hudson Avenue
Chicago, IL 60614

1987

Demaris Affleck Carrell '47
158 S. Prospect Street
Oberlin, OH 44074

James B. Kirkhoff '48
2703 Leighton Road
Shaker Heights, OH 44120

1988

Joan Heifetz Hollinger '61
502 Rock Creek Drive
Ann Arbor, MI 48104

Robert G. Merin, M.D. '54
2725 Albans Avenue
Houston, TX 77005

Virgil Loeb, Jr., M.D. '42
24 Deerfield Road
St. Louis, MO 63124

Zone F

Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, territories, dependencies, and foreign countries

1988

Anita A. Cava '75
8015 SW 107th Avenue, #214
Miami, FL 33173

Zone G

Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming

1986

Suzanne White Hull '43
1465 El Mirador Drive
Pasadena, CA 91103

Charles G. McLeavy '73
223 Boylston Avenue East
Seattle, WA 98102

1987

Walter Cochran-Bond '70
2843 N. Tanable Drive
Altadena, CA 91001

Diana Royce Smith '68
1930 Oak Avenue
Boulder, CO 80302

The Faculty

David W. Fraser, B.A., Haverford College; M.D., Harvard Medical School, President. 324 Cedar Lane.

James W. England, B.A., Kansas State Teachers College; M.A. and Ph.D., University of Missouri, Provost and Professor of Mathematics. 925 Strath Haven Avenue.

Janet Smith Dickerson, B.A., Western College for Women; M.Ed., Xavier University, Dean of the College. 531 Bryn Mawr Avenue.

Kendall Landis, B.A., Swarthmore College; M.A., Wesleyan University, Vice President —Alumni, Development, Public Relations. 550 Elm Avenue.

Elizabeth Chadwick, A.B., Bryn Mawr College; M. Phil and Ph.D., Yale University, Associate Dean of the College, Lecturer in English Literature. 513 Ogden Avenue.

Robert A. Barr, Jr., B.A., Swarthmore College; M.A., University of Pennsylvania, Dean of Admissions. 510 Strath Haven Avenue.

Jane H. Mullins, B.A., Swarthmore College, Registrar. 11 S. Princeton Avenue.

Michael Durkan, B.A., St. Patrick's College, Maynooth, Ireland; Diploma in Library Training, University College, Dublin, Librarian. 201 West Rose Valley Road, Wallingford, PA 19086.

Emi K. Horikawa, B.S., University of Nevada; M.A., University of Utah, Science Librarian. 309 Rutgers Avenue.

Stephen Lehmann, B.A., M.A., and M.L.S., University of California, Berkeley; Ed.M., Harvard University, Humanities Librarian. 300 Harvard Avenue.

Susan G. Williamson, B.A., University of California, Berkeley; M.A. and Ph.D., University of Pennsylvania, Social Sciences Librarian. 602 Elm Avenue.

Leighton C. Whitaker, B.A., Swarthmore College; M.A., University of Connecticut; Ph.D., Wayne State University; Diplomate in Clinical Psychology of the American Board of Professional Psychology, Director, Psychological Services. 220 Turner Road, Wallingford, PA 19086.

EMERITI

Mary Albertson, B.A., M.A. and Ph.D., Bryn Mawr College, Isaac H. Clothier Professor Emerita of History and International Relations. 505 Ogden Avenue.

Elisa Asensio, M.A., Middlebury College, Professor Emerita of Spanish. 510 Panmure Road, Haverford, PA 19041.

Lydia Baer, B.A., Oberlin College; M.A. and Ph.D., University of Pennsylvania, Professor Emerita of German. Manatee River Hotel, Bradenton, FL 33505.

Carl Barus, B.A., Brown University; M.S. in E.E., Massachusetts Institute of Technology, Professor Emeritus of Engineering. 404 Walnut Lane.

Paul H. Beik, B.A., Union College, M.A. and Ph.D., Columbia University, Centennial Professor Emeritus of History. 2461 Venetian Way, Winter Park, FL 32789.

Heinrich Brinkmann, B.A., Stanford University; M.A. and Ph.D., Harvard University, Albert L. and Edna Pownall Buffington Professor Emeritus of Mathematics. Wallingford Arms, Wallingford, PA 19086

Alice Brodhead, B.S. and M.A., University of Pennsylvania, Professor Emerita of Education. 144 Park Avenue.

Hilde D. Cohn, Dr. Phil., University of Heidelberg, Professor Emerita of German. Strath Haven Condominiums.

Tatiana M. Cosman, B.A. and M.A., Middlebury College; M.A., Columbia University; Ph.D., New York University, Assistant Professor (part-time) Emerita of Russian. 306 S. Chester Road.

William C. Elmore, B.S., Lehigh University; Ph.D., Yale University, Morris L. Clothier Professor Emeritus of Physics. 288 Paxon Hollow Road, Media, PA 19063.

Lewis H. Elverson, B.S., University of Pennsylvania, Professor Emeritus of Physical Education for Men. Quidnet, Nantucket, MA 02554.

Robert K. Enders, B.A. and Ph.D., University of Michigan, Isaac H. Clothier, Jr., Professor Emeritus of Biology. 311 Elm Avenue.

E. J. Faulkner, Professor Emeritus of Physical Education for Men. 500 Osceola Avenue, Apt. 210, Winter Park, FL 32789.

Edward A. Fehnel, B.S., M.S., and Ph.D., Lehigh University, Edmund Allen Professor Emeritus of Chemistry. 120 Paxon Hollow Road, Rose Tree, Media, PA 19063.

James A. Field, Jr., B.S., M.A., and Ph.D., Harvard University, Isaac H. Clothier Professor Emeritus of History. 605 Hillborn Avenue.

Launce J. Flemister, B.A., M.A. and Ph.D., Duke University, Professor Emeritus of Zoology. P.O. Box F, Swarthmore, PA 19081.

Milan W. Garrett, B.A. and M.A., Stanford University; B.A. and D. Phil., University of Oxford, Professor Emeritus of Physics. 16 Beach Road, Severna Park, MD 21146.

Barbara Lange Godfrey, Dean Emerita of Women. Strath Haven Condominiums.

Fredric Klees, B.A., Bowdoin College, Professor Emeritus of English. 220 South Chester Road.

Olga Lang, Graduate, University of Moscow; Ph.D., Columbia University, Professor Emerita of Russian. 611 W. 111th St., New York, NY 10025.

Sarah Lee Lippincott, B.A., University of Pennsylvania; M.A., Swarthmore College; D.Sc., Villanova University, Professor Emeritus of Astronomy and Director Emeritus of the Sproul Observatory. 507 Cedar Lane.

Luzern G. Livingston, B.S., Lawrence College; Ph.D., University of Wisconsin, Professor Emeritus of Botany. 15 Dartmouth Circle.

Franz H. Mautner, Dr. Phil., University of Vienna, Professor Emeritus of German. 408 Walnut Lane.

John D. McCrumm, B.A. and M.S., University of Colorado, Howard N. and Ada J. Eavenson Professor Emeritus of Engineering. 606 Ogden Avenue.

Norman A. Meinkoth, B. of Ed., Southern Illinois Teachers College; M.S. and Ph.D., University of Illinois, Professor Emeritus of Zoology. 431 West Woodland Avenue, Springfield, PA 19064.

Irene Moll, B.S. in Ed., University of Kansas; M.A., Texas University for Women, Associate Professor Emerita of Physical Education for Women. 805 Illinois Street, Lawrence, KS 66044.

John M. Moore, B.A., Park College; B.D., Union Theological Seminary; M.A., Harvard University; Ph.D., Columbia University, Professor Emeritus of Philosophy and Religion. Friends Home, 400 N. Walnut Street, West Chester, PA 19380.

Bernard Morrill, B.S. in M.E., Massachusetts Institute of Technology; M.M.E., University of Delaware, Ph.D., University of Michigan, Henry C. and J. Archer Turner Professor Emeritus of Engineering. 21 Oberlin Avenue.

J. Roland Pennock, B.A., Swarthmore College; M.A. and Ph.D., Harvard University, Richter Professor Emeritus of Political Science. 739 Harvard Avenue.

Frank C. Pierson, B.A., Swarthmore College; Ph.D., Columbia University, Joseph Wharton Professor Emeritus of Political Economy. 740 Ogden Avenue.

Hedley H. Rhys, B.A., West Virginia University; M.A. and Ph.D., Harvard University, Professor Emeritus of Art History. Apt. 217, Crosslands, Kennett Square, PA 19348.

James D. Sorber, B.A., Lehigh University; M.A., University of Nebraska, Professor Emeritus of Spanish. #57 Kendal at Longwood, Kennett Square, PA 19348.

Bernard S. Smith, B.A. and M.A., University of Oxford; Ph.D., Harvard University, Professor Emeritus of History.

Willis J. Stetson, B.A., Swarthmore College; M.A., University of Pennsylvania, Professor Emeritus of Physical Education for Men. 144 North Highland Road, Springfield, PA 19064.

Gilmore Stott, B.A. and M.A., University of Cincinnati; B.A. and M.A., University of Oxford; M.A. and Ph.D., Princeton University, Associate Provost Emeritus and Associate Dean of the College Emeritus. 318 Dartmouth Avenue.

Derek Traversi, B.A. and M.A., University of Oxford, Alexander Griswold Cummins Professor Emeritus of English. 12 Richmond Mansions, Denton Road, Twickinham, Midd, TW 1, 2HH, England.

Peter van de Kamp, Cand. and Docts., University of Utrecht; Ph.D., University of California; D. Phil., University of Groningen, Edward Hicks Magill Professor Emeritus of Astronomy and Director Emeritus of the Sproul Observatory. c/o Peter Rademacher, R.D. 2, Salem, New York 12865.

Robert M. Walker, B.A. and M.F.A., Princeton University; Ph.D., Harvard University. Professor Emeritus of Art History. 865 Central Avenue, L504, Needham, MA 02192.

Hans Wallach, Dr. Phil., University of Berlin, Centennial Professor Emeritus of Psychology. 510 Bryn Mawr Avenue.

Neal A. Weber, B.A., M.S. and D.Sc., University of North Dakota; M.A. and Ph.D., Harvard University, Professor Emeritus of Zoology. 1805 Aaron Drive, Tallahassee, FL 32303.

PROFESSORS

Margaret Anderson,[3] B.A., Swarthmore College; Ph.D., Brown University, Professor of History. 214 Rutgers Avenue.

George C. Avery,[3] B.A., M.A., and Ph.D., University of Pennsylvania, Professor of German. 230 Haverford Avenue.

Robert C. Bannister, B.A. and Ph.D., Yale University; B.A. and M.A., University of Oxford, Professor of History. 737 Harvard Avenue.

Olexa-Myron Bilaniuk, Cand. Ingénieur, Université de Louvain; B.S.E., B.S., M.S., M.A. and Ph.D., University of Michigan, Centennial Professor of Physics. 100 Plush Mill Road, Wallingford, PA 19086.

Thomas H. Blackburn,[2] B.A., Amherst; B.A. and M.A., University of Oxford; Ph.D., Stanford University, Professor of English. 609 Elm Avenue.

John R. Boccio, B.S., Polytechnic Institute of Brooklyn; Ph.D., Cornell University, Professor of Physics. 6 Whittier Place.

David L. Bowler, B.S. in E.E., Bucknell University; M.S. in E.E., Massachusetts Institute of Technology; M.A. and Ph.D., Princeton University, Professor of Electrical Engineering. 505 Yale Avenue.

Thompson Bradley, B.A., Yale University; M.A., Columbia University, Professor of Russian. Price's Lane, Moylan, PA 19065.

Kazimierz Braun, Master of Letters, Poznan University; Master of Fine Arts, National School of Drama; Ph.D., Poznan University; Doctor of Fine Arts, Wroclaw University, Visiting Professor of English Literature. 204 Strath Haven Condominium.

Dennis Brutus, B.A., Fort Hare University, Julien and Virginia Cornell Visiting Professor of English. 405 Walnut Lane.

Gomer H. Davies, B.S., East Stroudsburg State College; Ed.M., Temple University, Professor of Physical Education. 225 Cornell Avenue.

Lee Devin,[3] B.A., San Jose College; M.A. and Ph.D., Indiana University, Professor of English Literature and Director of The Theatre. 512 Elm Avenue.

2 Absent on leave, spring semester, 1986.
3 Absent on leave, 1985-86.

H. Searl Dunn,[2] B.S.E. and M.S.E., Princeton University; Ph.D., Brown University, Henry C. and J. Archer Turner Professor of Engineering. 603 Elm Avenue.

Stefano Fenoaltea,[5] B.A., Georgetown University; M.A. and Ph.D., Harvard University; D.Jur., Universita di Roma, Visiting Professor of Economics.

James D. Freeman, B.A., M.A., and Ph.D., Harvard University, Professor of Music and Director of the Orchestra. 206 Martroy Lane, Wallingford, PA 19086.

J. William Frost,[2] B.A., DePauw University; M.A. and Ph.D., University of Wisconsin, Howard M. and Charles F. Jenkins Professor of Quaker History and Research, and Director of the Friends Historical Library. 3 Whittier Place.

John E. Gaustad,[1] B.A., Harvard University; Ph.D., Princeton University, Professor of Astronomy. 430 S. Chester Road.

Kenneth J. Gergen, B.A., Yale University; Ph.D., Duke University, Professor of Psychology. 331 Rogers Lane, Wallingford, PA 19086.

Charles E. Gilbert, B.A., Haverford College; Ph.D., Northwestern University, Professor of Political Science, 223 Kenyon Avenue.

James H. Hammons,[2] B.A., Amherst College; M.A. and Ph.D., The Johns Hopkins University, Professor of Chemistry. 17 Furness Lane, Wallingford, PA 19086.

Vincent Harding, B.A., City College of New York; M.S., Columbia University; M.A., University of Chicago, Lang Visiting Professor of Religion. 401 Walnut Lane.

Mark A. Heald, B.A., Oberlin College; M.S. and Ph.D., Yale University, Professor of Physics. 420 Rutgers Avenue.

Wulff D. Heintz, Dr. rer. nat. München University, Professor of Astronomy. 540 Riverview Avenue.

Eleanor K. Hess,[4] B.S. and M.S., University of Pennsylvania, Professor of Physical Education. 302 North Chester Road.

Robinson G. Hollister, Jr., B.A., Amherst College; Ph.D., Stanford University, Professor of Economics (part-time). 1 Whittier Place.

Raymond F. Hopkins, B.A., Ohio Wesleyan University; M.A., Ohio State University; M.A. and Ph.D., Yale University, Professor of Political Science. 308 Ogden Avenue.

Gudmund R. Iversen, M.A., University of Michigan; Ph.D., Harvard University, Professor of Statistics, and Director, Center for Social and Policy Studies. 212 Elm Avenue.

Charles L. James, B.S., State University of New York at Albany, Professor of English Literature. 402 Laurel Lane, Wallingford, PA 19086.

John B. Jenkins, B.S. and M.S., Utah State University; Ph.D., University of California, Los Angeles, Professor of Biology. 403 Walnut Lane.

Jennie Keith, B.A., Pomona College; M.A. and Ph.D., Northwestern University, Professor of Anthropology. 612 Ogden Avenue.

Charles F. Kelemen,[12] B.A., Valparaiso University; Ph.D., Pennsylvania State University, Professor of Computer Science and Mathematics. 606 Elm Avenue.

T. Kaori Kitao, B.A. and M.A., University of California, Berkeley; Ph.D., Harvard University, Professor of Art History. 540 Westminster Avenue.

Eugene A. Klotz,[2] B.S., Antioch College; Ph.D., Yale University, Professor of Mathematics. 735 Yale Avenue.

George Krugovoy, B.A., M.A., and Ph.D., Philosophical Institute, Salzburg, Austria, Professor of Russian. 562 Juniata Avenue.

1 Absent on leave, fall semester, 1985.
2 Absent on leave, spring semester, 1986.
4 Fall semester, 1985.
5 Spring semester, 1986.
12 Joint appointment with mathematics.

Faculty

James R. Kurth, B.A., Stanford University; M.A. and Ph.D., Harvard University, Professor of Political Science. Strath Haven Condominiums.

Hugh M. Lacey, B.A. and M.A., University of Melbourne; Ph.D., Indiana University, Professor of Philosophy. 4 Whittier Place.

Asmarom Legesse, B.A., University College of Addis Ababa; Ed.M. and Ph.D., Harvard University, Professor of Anthropology. 407 Vassar Avenue.

Nelson A. Macken, B.S., Case Institute of Technology; M.S., Ph.D., University of Delaware, Professor of Engineering. 250 Haverford Avenue.

Paul C. Mangelsdorf, Jr.,[2] B.A., Swarthmore College; Ph.D., Harvard University, Morris L. Clothier Professor of Physics. 110 Cornell Avenue.

Philip Metzidakis, B.A., Dartmouth College; Ph.D., Yale University, Professor of Spanish. 113 Governors Drive, Wallingford, PA 19086.

Kathryn L. Morgan, B.A., Virginia State College; M.A., Howard University; M.A. and Ph.D., University of Pennsylvania, Professor of History. Apt. 728, Strath Haven Condominiums.

Helen F. North, B.A., M.A., and Ph.D., Cornell University, Centennial Professor of Classics. 604 Ogden Avenue.

Hans F. Oberdiek, B.S., and Ph.D., University of Wisconsin, Professor of Philosophy. 410 Dickinson Avenue.

Martin Ostwald, B.A., University of Toronto; M.A., University of Chicago; Ph.D., Columbia University, William R. Kenan, Jr., Professor of Classics. 2 Whittier Place.

Howard Pack, B.B.A., City College of New York; Ph.D., Massachusetts Institute of Technology, Professor of Economics. 1420 Locust St., Philadelphia, PA 19102.

Harold E. Pagliaro, A.B., M.A., Ph.D., Columbia University, Alexander Griswold Cummins Professor of English Literature. 536 Ogden Avenue.

Robert F. Pasternack,[1] B.A. and Ph.D., Cornell University, Edmund Allen Professor of Chemistry. 110 Cornell Avenue.

Dean Peabody,[2] B.A., Swarthmore College; Ph.D., Harvard University, Professor of Psychology. 405 Rogers Lane, Wallingford, PA 19086.

Jean Ashmead Perkins, B.A., Swarthmore College; M.A. and Ph.D., Columbia University, Susan W. Lippincott Professor of French. 913 Strath Haven Avenue.

Steven I. Piker, B.A., Reed College; Ph.D., University of Washington, Professor of Anthropology. 125 Rutgers Avenue.

Frederic L. Pryor,[3] B.A., Oberlin College; M.A. and Ph.D., Yale University, Professor of Economics (part-time). 740 Harvard Avenue.

Gilbert P. Rose, B.A. and Ph.D., University of California, Berkeley, Professor of Classics. 551 Marietta Avenue.

David Rosen, B.A., New York University; M.A. and Ph.D., University of Pennsylvania, Professor of Mathematics. 336 North Princeton Avenue.

Robert Roza,[10] B.A., University of Toronto; M.A. and Ph.D., Princeton University, Professor of French. 233 Cornell Avenue.

Bernard Saffran,[1] B.A., City College of New York; Ph.D., University of Minnesota, Professor of Economics. 201 Garrett Avenue.

Robert E. Savage, B.A., Oberlin College; M.S. and Ph.D., University of Wisconsin, Isaac H. Clothier, Jr. Professor of Biology. 411 Vassar Avenue.

F. M. Scherer,[3] A.B., University of Michigan; M.B.A. and Ph.D., Harvard

1 Absent on leave, fall semester, 1985.
2 Absent on leave, spring semester, 1986.
3 Absent on leave, 1985-86.
10 Program Director, Swarthmore Program in Grenoble, spring semester, 1986.

University, Joseph Wharton Professor of Political Economy. 35 Wellesley Road.

Allen M. Schneider, B.S., Trinity College; Ph.D., Indiana University, Professor of Psychology. 608 Elm Avenue.

Richard Schuldenfrei, B.A. and M.A., University of Pennsylvania; Ph.D., University of Pittsburgh, Professor of Philosophy. 8 S. Lemon St., Media, PA 19063.

Barry Schwartz, B.A., New York University; M.A. and Ph.D., University of Pennsylvania, Professor of Psychology. 210 Garrett Avenue.

J. Edward Skeath, B.A., Swarthmore College; M.A. and Ph.D., University of Illinois, Professor of Mathematics. 400 Dickinson Avenue.

David G. Smith, B.A., and M.A., University of Oklahoma; Ph.D., The Johns Hopkins University, Centennial Professor of Political Science. 63 Todmordon Dr., Rose Valley, PA 19086.

Simone Voisin Smith,[9] Licence et Lettres, University of Grenoble, Professor of French. 125 Forest Lane.

Susan Snyder, B.A., Hunter College; M.A. and Ph.D., Columbia University, Eugene M. Lang Research Professor of English Literature. 524 Westminster Avenue.

Donald K. Swearer,[3] B.A., M.A. and Ph.D., Princeton University; B.D. and S.T.M., Yale Divinity School, Professor of Religion. 109 Columbia Avenue.

Peter Gram Swing, B.A. and M.A., Harvard University; Ph.D., University of Chicago. Daniel Underhill Professor of Music and Director of the Chorus. 614 Hillborn Avenue.

Francis P. Tafoya, B.S. and M.A., University of Colorado; Ph.D., Yale University, Professor of French and Spanish. 620 North Chester Road.

Peter T. Thompson, B.A., The Johns Hopkins University; Ph.D., University of Pittsburgh, Professor of Chemistry. 203 College Avenue.

P. Linwood Urban, Jr., B.A., Princeton University; S.T.B., S.T.M. and Th.D., General Theological Seminary, Charles and Harriet Cox McDowell Professor of Religion. 20 South Princeton Avenue.

Eugene Weber,[1] B.A., Williams College; M.A. and Ph.D., Harvard University, Professor of German. 409 Strath Haven Avenue.

Philip M. Weinstein, A.B., Princeton University; A.M. and Ph.D., Harvard University, Professor of English Literature. 510 Ogden Avenue.

Larry E. Westphal, B.A. Occidental College; Ph.D., Harvard University, Professor of Economics. Swarthmore College.

M. Joseph Willis, B.C.E., University of Washington; M.S., Cornell University; Ph.D., The Johns Hopkins University, Professor of Engineering. 306 Chestnut Lane.

Jerome H. Wood, Jr., B.A., Howard University; Ph.D., Brown University, Professor of History. 103 E. Providence Rd., Aldan, PA 19014.

Harrison M. Wright, B.A., M.A., and Ph.D, Harvard University, Professor of History. 319 Cedar Lane.

ASSOCIATE PROFESSORS

Charles R. Beitz, B.A. Colgate University; M.A., University of Michigan; M.A. and Ph.D., Princeton University, Associate Professor of Political Science. 509 Harvard Avenue.

Douglas Bennett, B.A., Haverford College; M.A. and Ph.D., Yale University, Visiting Associate Professor of Political Science. Swarthmore College.

1 Absent on leave, fall semester, 1985.
3 Absent on leave, 1985-86.
9 Program Director, Swarthmore Program in Grenoble, fall semester, 1985.

Faculty

Alfred H. Bloom,[2 7 11] B.A., Princeton University; M.A., and Ph.D., Harvard University, Associate Professor of Linguistics and Psychology, and Program Director of Linguistics. 5 Woodbrook Lane.

Michael W. Cothren,[3] B.A., Vanderbilt University; M.A. and Ph.D., Columbia University, Associate Professor of Art History. 406 N. Swarthmore Avenue.

Robert S. Du Plessis,[1] B.A., Williams College; M.A. and Ph.D., Columbia University, Associate Professor of History. 211 Rutgers Avenue.

Marion J. Faber, B.A. and M.A., University of California, Berkeley; Ph.D., Harvard University, Associate Professor of German (part-time). 234 Benjamin West Avenue.

Dorothea Frede, Hamburg University; Ph.D., Gottingen University, Associate Professor of Philosophy. Crum Ledge #5.

Sharon Friedler, B.A., Colby College; M.F.A., Southern Methodist University, Associate Professor of Dance and Director of the Dance Program. 517 Elm Avenue.

Nancy V. Hamlett,[3] B.S. and M.S., University of Florida, Gainesville; Ph.D., The Johns Hopkins University, Associate Professor of Biology. 915 Harvard Avenue.

John J. Hassett,[1] B.A., St. Francis College; M.A., University of Iowa; Ph.D., University of Wisconsin, Associate Professor of Spanish. 514 S. Providence Road, Wallingford, PA 19086.

Constance Cain Hungerford, B.A., Wellesley College; M.A., Ph.D., University of California, Berkeley, Associate Professor of Art History. 815 Westdale Avenue.

Mark Jacobs, B.A., Harvard University; Ph.D., Stanford University, Associate Professor of Biology. 401 Dickinson Avenue.

William Jordan, A.B., Ripon College; Ph.D., Princeton University, Visiting Associate Professor in History. Swarthmore College.

Deborah G. Kemler-Nelson, B.A., M.A., and Ph.D., Brown University, Associate Professor of Psychology. 211 Benjamin West Avenue.

Mark Kuperberg, B.A., Amherst College; M.A. and Ph.D., Massachusetts Institute of Technology, Associate Professor of Economics. 147 Park Avenue.

Gerald Levinson, B.A., University of Pennsylvania; M.A. and Ph.D., University of Chicago, Associate Professor of Music. 2 Crum Ledge.

Lillian M. Li, A.B., Radcliffe College; A.M. and Ph.D., Harvard University, Associate Professor of History. 8 Whittier Place.

Jeanne Marecek, B.S., Loyola University; Ph.D., Yale University, Associate Professor of Psychology. 325 S. Monroe St., Media, PA 19063.

Stephen B. Maurer, B.A., Swarthmore College; M.A. and Ph.D., Princeton University, Associate Professor of Mathematics. 206 Benjamin West Avenue.

Arthur E. McGarity,[3] B.A., Trinity University; M.S.E., Ph.D., The Johns Hopkins University, Associate Professor of Engineering. 135 Rutgers Avenue.

Brian A. Meunier, B.F.A., University of Massachusetts, Amherst; M.F.A., Tyler School of Art, Temple University, Associate Professor of Studio Arts. Benjamin West House.

Bruce Molholt, B.A., Hendrix College; M.S., University of Arkansas; Ph.D., Indiana University, Visiting Associate Professor of Biology. Swarthmore College.

George Moskos,[8] B.A., Davidson College; M.A. and Ph.D., University of Wisconsin, Madison, Associate Professor of French. 730 Yale Avenue.

Braulio Muñoz,[1] B.A., University of Rhode

1 Absent on leave, fall semester, 1985.
2 Absent on leave, spring semester, 1986.
3 Absent on leave, 1985-86.
7 Joint appointment with psychology.
8 Campus coordinator, Grenoble Program.
11 Joint appointment with linguistics.

Island; Ph.D., University of Pennsylvania, Associate Professor of Sociology. 500 Harvard Avenue.

Frederick L. Orthlieb, B.S. and M.S., Massachusetts Institute of Technology; Ph.D., Carnegie-Mellon University, Associate Professor of Engineering. 13 Green Valley Road, Wallingford, PA 19086.

Mary L. Poovey, B.A., Oberlin College; M.A. and Ph.D., University of Virginia, Associate Professor of English Literature. 603 Ogden Avenue.

Ernest J. Prudente, B.S. and M.S., University of Pennsylvania, Associate Professor of Physical Education. 914 Surrey Road, Media, PA 19063.

Charles Raff,[3] B.A., University of Rochester; M.A. and Ph.D., Brown University, Associate Professor of Philosophy. 214 Rutgers Avenue.

Albert M. Rosenberg,[3] B.A., Harvard University; M.S., University of Florida; Ph.D., University of Pennsylvania, Associate Professor of Natural Science. 915 Harvard Avenue.

Richard L. Rubin, A.B., Brown University; M.A. and Ph.D., Columbia University, Associate Professor of Political Science and Public Policy (part-time). 504½ Riverview Road.

Kenneth E. Sharpe,[3] B.A., Dartmouth College; M.S., London School of Economics and Political Science; Ph.D., Yale University, Associate Professor of Political Science. 521 Elm Avenue.

David B. Smoyer,[1] B.A., Dartmouth College; LL.B., Harvard Law School, Associate Professor of Physical Education. 335 Park Avenue.

Eva F. Travers, B.A., Connecticut College; M.A. and Ed.D., Harvard University, Associate Professor of Education. 416 Park Avenue.

Judith G. Voet, B.S., Antioch College; Ph.D., Brandeis University, Associate Professor of Chemistry. 368 Trevor Lane, Bala Cynwyd, PA 19004.

Jacob Weiner,[3] B.A., Antioch College; M.S., University of Michigan; Ph.D., University of Oregon, Associate Professor of Biology. 405 E. Rose Valley Road, Wallingford, PA 19086.

Douglas M. Weiss, A.T.C., Associate Professor of Physical Education. 117 S. Chester Road.

Timothy C. Williams, B.A., Swarthmore College; A.M., Harvard University; Ph.D., Rockefeller University, Associate Professor of Biology. 314 Rutgers Avenue.

Craig Williamson, B.A., Stanford University; M.A., Harvard University; Ph.D., University of Pennsylvania, Associate Professor of English Literature. 602 Elm Avenue.

ASSISTANT PROFESSORS

Nathalie F. Anderson,[3] B.A. Agnes Scott College; M.A., Georgia State University, Assistant Professor of English Literature. 515 Elm Avenue.

Sarah Bassett,[4] B.A., Smith College; M.A., University of Chicago; Ph.D., Bryn Mawr College, Assistant Professor of Art. Swarthmore College.

Betsey Batchelor, B.F.A., Philadelphia College of Art; M.F.A., Rhode Island School of Design, Assistant Professor of Art. Swarthmore College.

Curtis Hansman Brizendine, B.A. and M.A., University of Oregon; M.Ph. and Ph.D., University of Kansas, Assistant Professor of Art History. 318 N. Chester Road.

Barbara Burrell, A.B., New York

1 Absent on leave, fall semester, 1985.
3 Absent on leave, 1985-86.
4 Fall semester, 1985.

University; M.A. and Ph.D., Harvard University, Assistant Professor of Classics. Swarthmore College.

Joy Charlton, B.A., University of Virginia; M.A. and Ph.D., Northwestern University, Assistant Professor of Sociology. 409½ Elm Avenue.

Jeffrey A. Charonnat, B.S., Stanford University; M.A., Columbia University, Assistant Professor in Chemistry. 409½ Elm Avenue.

Jonathan Copeland, B.A., Tufts University; Ph.D., State University of New York at Stony Brook, Assistant Professor of Biology. Swarthmore College.

Susan P. Davis, B.S., Springfield College; M.S., Smith College, Assistant Professor of Physical Education. 2411 Whitehouse Road, Berwyn, PA 19312.

Richard Eldridge,[3] A.B., Middlebury College; M.A. and Ph.D., University of Chicago, Assistant Professor of Philosophy. 423 Harvard Avenue.

Randall L. Exon,[3] B.F.A., Washburn University; M.A. and M.F.A., University of Iowa, Assistant Professor of Studio Arts. 8 Crum Ledge.

Gregory L. Florant, B.S., Cornell University, Ph.D., Stanford University, Assistant Professor of Biology. 404 Elm Avenue.

Gary Forsythe, B.A. and M.A., University of Illinois; Ph.D., University of Pennsylvania, Assistant Professor of Classics. 404 Elm Avenue.

Scott F. Gilbert, B.A., Wesleyan University; M.A. and Ph.D., The Johns Hopkins University, Assistant Professor of Biology. 617 Fairview Road.

Stephen S. Golub,[1] B.A., Williams College; M.A. and Ph.D., Yale University, Assistant Professor of Economics. 318 N. Chester Road.

Charles M. Grinstead, B.A., Pomona College; M.A. and Ph.D., University of California, Los Angeles, Assistant Professor of Mathematics. 8 Whittier Place.

Rush D. Holt, B.A. Carleton College; M.S. and Ph.D., New York University, Assistant Professor of Physics. 302 N. Chester Road.

Philip J. Kellman, B.A., Georgetown University; M.A. and Ph.D., University of Pennsylvania, Assistant Professor of Psychology. 1021 Stewart Avenue, Springfield, PA 19064.

Laurie Langbauer, B.A., Wesleyan University; M.A., Cornell University, Visiting Assistant Professor of English Literature. 915 Harvard Avenue.

Thomas P. Leff, B.A. and M.F.A., Case Western Reserve University, Assistant Professor of English Literature and Technical Director for the Theatre. 6 Crum Ledge.

Amy Jill Levine, B.A., Smith College; M.A. and Ph.D., Duke University, Assistant Professor of Religion. Swarthmore College.

Kenneth C. Luk, B.A., International Christian University, Tokyo; Ph.D., University of Pennsylvania, Assistant Professor of Chinese. 2126 Lombard Street, Philadelphia, PA 19146.

Ann Kosakowski McNamee, B.A., Wellesley College; M.Phil. and Ph.D., Yale University, Assistant Professor of Music. 318 N. Chester Road.

Francis Meagher, B.A., Holy Cross College, Assistant Professor of Physical Education. 3726 Woodland Avenue, Drexel Hill, PA 19026.

Rachel Merz, B.A., Western New Mexico University; M.S., University of Florida; Ph.D., University of Chicago, Assistant Professor of Biology. 515 Elm Avenue.

Lynne A. Molter, B.A. and B.S., Swarthmore College; Ph.D., Massachusetts Institute of Technology, Assistant Professor of Engineering. Swarthmore College.

Frank A. Moscatelli,[3] B.S., C. W. Post College; M.S. and Ph.D., New York University, Assistant Professor of Physics.

1 Absent on leave, fall semester, 1985.

3 Absent on leave, 1985-86.

302 Avondale Road, Wallingford, PA 19086.

Michael L. Mullan,[1] B.A., University of California, Berkeley; Assistant Professor of Physical Education. 511 Harvard Avenue.

Marjorie Murphy, B.A., Jersey City State College; M.A., San Jose State University; Ph.D., University of California, Davis, Assistant Professor of History. 513 Elm Avenue.

Joyce J. Nagata,[2] B.F.A. and M.A., University of Illinois, Champaign; M.F.A., University of Wisconsin, Milwaukee; Assistant Professor of Studio Arts (part-time). 3 Crum Ledge.

K. Ann Renninger,[3] B.A., University of Pennsylvania; M.A. and Ph.D., Bryn Mawr College, Assistant Professor of Education. 915 Harvard Avenue.

Eugene Schlossberger, B.A., Brandeis University; M.A. and Ph.D., University of Chicago, Visiting Assistant Professor of Philosophy. Swarthmore College.

Peter J. Schmidt, B.A., Oberlin College; M.A. and Ph.D., University of Virginia, Assistant Professor of English Literature. 7 Crum Ledge.

Paula Sepinuck, B.A., Bennington College, Assistant Professor of Dance and Acting Director of the Dance Program. 309 Dickinson Avenue.

Helene Shapiro, B.A., Kenyon College; M.A. Princeton University; Ph.D., California Institute of Technology, Assistant Professor of Mathematics. Swarthmore College.

Don Shimamoto, B.S., Stanford University; M.A. and Ph.D., Brandeis University, Assistant Professor of Mathematics. Swarthmore College.

Ann E. Shinnar, B.A., Goucher College; M.A. and Ph.D., Princeton University, Assistant Professor of Chemistry. Swarthmore College.

Faruq M. A. Siddiqui,[3] B.S., Bangladesh University of Engineering and Technology; M.S. and Ph.D., University of Pittsburgh, Assistant Professor of Engineering. Apt. A-2, 107 Rutgers Avenue.

Lisa Smulyan, B.A., Swarthmore College; M.A.T., Brown University; Ed.D., Harvard Graduate School of Education, Assistant Professor of Education. Swarthmore College.

Thomas Stephenson, B.S., Furman University; Ph.D., The University of Chicago, Assistant Professor of Chemistry. 404 Elm Avenue.

Barbara Yost Stewart, B.A., Swarthmore College; M.A. and Ph.D., Bryn Mawr College, Assistant Professor of Biology. 543 Marietta Avenue.

William N. Turpin, M.A., University of St. Andrews; M.A., University of Toronto; Ph.D., Cambridge University, Assistant Professor of Classics. Swarthmore College.

Andrew M. Verner, B.A., Duke University; M.A., Old Dominion University; Ph.D., Columbia University, Assistant Professor of History. 11 Benjamin West Avenue.

Robin E. Wagner-Pacifici, B.A., Brown University; M.A. and Ph.D., University of Pennsylvania, Assistant Professor of Sociology. 604 Elm Avenue.

INSTRUCTORS

Elizabeth Anderson, B.A., Swarthmore College; A.M., Harvard University, Instructor in Philosophy. 404 Elm Avenue.

Abbe Blum, B.A., University of California, Berkeley; B.A. and M.A., Cambridge University, Instructor in English Literature. Benjamin West House.

Vivian-Lee Nyitray, A.B., Syracuse University; A.M., Stanford University, Instructor in Religion. Swarthmore College.

1 Absent on leave, fall semester, 1985.
2 Absent on leave, spring semester, 1986.
3 Absent on leave, 1985-86.

Stephen M. Platt, B.S., Rensselaer Polytechnic Institute; M.S.E., University of Pennsylvania, Instructor in Engineering. Swarthmore College.

Paul F. Rabideau, B.A., Fairfield University; M.A., Rutgers University, Instructor in Economics. Swarthmore College.

Gaile Rockey, B.S., West Chester University, Instructor in Physical Education. Wawa Road, Wawa, PA 19063.

Valerie Rubsamen, B.A., University of California; M.A., University of California; M.A., Princeton University, Instructor in Political Science. Swarthmore College.

Monika Shafi, M.A., University of Freiburg; Ph.D., University of Maryland, Instructor in Modern Languages. Swarthmore College.

Nilgun Sungar, B.S., Middle East Technical University, Instructor in Physics. Swarthmore College.

Mingwhei Tung, B.S., Jilin University; M.S. and Ph.D., Drexel University, Instructor in Physics. Swarthmore College.

Howard Wial,[4] A.B., University of Michigan, Instructor in Economics. Swarthmore College.

LECTURERS (all part-time)

Usha Balamore, Teachers Certificate, Church Park Teachers Training College; M.A., Bryn Mawr College, Lecturer in Education. Swarthmore College.

Leila Berner,[4] B.A., Hebrew University of Jerusalem; M.A. and Ph.D., University of California, Los Angeles, Lecturer in Religion and History. Swarthmore College.

Wei Chang, B.A., Beijing Language Institute, Lecturer in Modern Languages. Swarthmore College.

Marcel L. Cherry, B.A. and Diploma of Education, University of Melbourne, Lecturer in English. Swarthmore College.

Margaret Christensen, A.B., M.A.T., Cornell University, Lecturer in Computer Science Program. Swarthmore College.

Edward Dixon, B.A., LaSalle College; M.A., Pennsylvania State University, Lecturer in German. Swarthmore College.

Robert Fisher, A.B., Marietta College; Ph.D., Indiana University, Lecturer in Chemistry. Swarthmore College.

Terry Friesz, B.A., University of Virginia; M.S., Courant Institute of Mathematical Sciences; Ph.D., Johns Hopkins University, Lecturer in Engineering. Swarthmore College.

Evgenyia L. Katsenelinboigen, Moscow Polygraphic Institute, Lecturer in Russian. 211 Mortroy Lane, Wallingford, PA 19086.

Robert Katz, B.A., Wesleyan University; M.A., University of Pennsylvania, Lecturer in Spanish. Swarthmore College.

Mary K. Kenney, A.B., Chestnut Hill College; M.A., Villanova University, Lecturer in Spanish. 404 Elm Avenue.

Marcia C. Linebarger, A.B., University of California, Berkeley; Ph.D., Massachusetts Institute of Technology, Lecturer in Linguistics. Swarthmore College.

Carole Netter, Maitrisse and DEA, University of Paris, Lecturer in French. Swarthmore College.

A. Endre Nyerges, B.A., Earlham College; M.A., University of Pennsylvania, Lecturer in Sociology/Anthropology. Swarthmore College.

Elke Plaxton, B.A., Brigham Young University; M.A., University of Colorado, Lecturer in German. 2022 Brandywine Street, Philadelphia, PA 19103.

Michael A. Sells,[4] A.B., Gonzaga University; M.A. and Ph.D., University of Chicago, Lecturer in Religion.

4 Fall semester, 1985.

Charles F. Stone, III, B.A., Swarthmore College; Ph.D., Yale University, Lecturer in Economics. Swarthmore College.

William J. Stull,[4] B.A., Northwestern University; Ph.D., Massachusetts Institute of Technology, Visiting Lecturer in Economics. Swarthmore College.

Alan Tessier, B.S., Cornell University; Ph.D., University of Pennsylvania, Lecturer in Biology. Swarthmore College.

Jack Topiol,[5] B.S., Yale University; M.A., University of Pennsylvania, Visiting Lecturer in Economics. 635 Heather Lane, Bryn Mawr, PA 19010.

ASSISTANTS AND ASSOCIATES (all part-time)

Thomas Arant, B.S., Clemson University, Assistant in Physical Education. Swarthmore College.

David Bronkema,[4] B.A., Swarthmore College, Assistant in Physical Education. Swarthmore College.

Benedict Cayenne,[5] B.A., University of Maryland North Shore, Assistant in Physical Education. Swarthmore College.

David Chyba, B.A., Lasalle College; M.A., University of Wisconsin, Assistant in Physics. Swarthmore College.

Ursula M. Davis, B.S., Colby Junior College, Assistant in Chemistry. 11 Rampart West, Media, PA 19063.

Lawrence Ehmer,[4] B.A., Swarthmore College, Assistant in Physical Education. Swarthmore College.

Diana Freedman, B.A., Pennsylvania State University; M.A. and Ph.D., Temple University, Assistant in Physical Education. 1356 Sellers Street, Philadelphia, PA 19129.

Dorothy K. Freeman, B.M., M.M., Boston University, Associate in Performance (Music). 206 Martroy Lane, Wallingford, PA 19086.

Lori Fries, Assistant in Physical Education.

Tedd R. Goundie, B.S., Muhlenberg College; M.S., Bowling Green State University, Assistant in Biology. 213 Sandy Bank Road, Media, PA 19063.

Curtis Lauber,[4] A.B., Duke University; M.A., Villanova University, Assistant in Physical Education. 110 School House Lane, Ardmore, PA 19003.

Margaret M. Lehman, B.A., Swarthmore College, Assistant in Chemistry. 105 Upper Gulph Road, Wayne, PA 19087.

Herbert Leimbach,[5] B.A., Swarthmore College, Assistant in Physical Education. 15 Forest Lane.

Karen Meyers, Associate in Performance (Music). 735 Yale Avenue.

Geoffrey Michaels, Diploma, Curtis Institute of Music, Associate in Performance (Music). Swarthmore College.

Carolyn Reichek, B.S., Columbia University, Associate in Performance (Dance). Swarthmore College.

Thomas Richards,[4] B.A., Trinity College, Assistant in Physical Education. 302 Dudley Avenue, Narberth, PA 19072.

Gloria U. Rosen, B.A., Hunter College; M.A., Mt. Holyoke College, Assistant in Biology. 336 N. Princeton Avenue.

Nancey Rosensweig, Associate in Performance (Dance). Swarthmore College.

Valerie Ryan, B.S., Widener University, Assistant in Physical Education. 1325 Chester Pike, Eddystone, PA 19013

Nita Harris Siciliano, B.S., Russell Sage College, Assistant in Chemistry. 1287 A Samuel Road, West Chester, PA 19380.

Robert M. Smart, B.A., Curtis Institute of Music; M.A., Westminster Choir College, College Organist and Associate in Performance (Music). 18 Oberlin Avenue.

C. Joseph Stefanowicz,[4] B.A., Lafayette College, Assistant in Physical Education. 921 Flora Lane, Boothwyn, PA 19061.

4 Fall semester, 1985.

5 Spring semester, 1986.

Dale Strawbridge,[4] B.S., Slippery Rock State College; M.Ed., Pennsylvania State University, Assistant in Physical Education. 8 Wood Lane, West Chester, PA 19380.

Pierre Trabut, Certificat D'Etudes Pedagogiques, Ecole Normale, Assistant in Modern Languages. 302 Chester Road.

Standing Committees of the Faculty 1985-86

Academic and Cultural Support

GILBERT, S., Chadwick, Dickerson, Kellman, Leff, Rose, Rubin, Skeath

Academic Requirements

DICKERSON, Bilaniuk, Chadwick, England, Florant, Kellman, Kuperberg, Morgan, Mullins, North, Roza, Savage, V.

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BLOOM, Li, Luk, Piker, Williamson, S.

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Bookstore

SWING, Chadwick, Jenkins, Kurth, Verner

Center for Social and Policy Studies

IVERSEN, Hollister, Murphy, Rubin, Siddiqui, Williamson, S.

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Cooper

LEVINSON, Bannister, Charonnat, Durkan, Landis, Moskos, Perkins, Schmidt, Williamson, C.

Curriculum

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Educational Policy, Council on

ENGLAND, Beitz, Fraser, Lacey, Maracek, Poovey, Travers, Weinstein.

Faculty Equal Opportunity Advisory

SMITH, S., Legesse, Shapiro

Faculty and Staff Benefits

HART, Aaron, Bowler, Cook, Davis, England, Grinstead, Hollister, Miller, T., Robinson, L., Saffran (spring), Schwartz, Van Ummersen

Faculty Procedures

FRASER, Bradley, Boccio, Bowler, Li, North, Pagliaro

Fellowships and Prizes

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Foreign Language Study

MOSKOS, Burrell, Chadwick, Luk

Health Sciences Advisory

STEWART, Chadwick, Gilbert, S., Mullins, Rosen, Schneider, Voet, Weiss

4 Fall semester, 1985.

Library

DURKAN, Aaron, England, Frost, Gergen, Kitao, Mauer, Metzidakis, Ostwald, Swing, Wood

Physical Education and Athletics

HOLLISTER, Bannister, Brizendine, Charlton, Hess, Prudente, Skeath, Vanni

Promotion and Tenure

FRASER, England, Heald, Hungerford, Lacey, H., Keith

Research Ethics

WILLIAMS, Burrell, Morgan, Peabody (spring), Schwartz, Weiss

Research Support

BILANIUK, Barazzone, Florant, Freeman, Gergen, Grinstead, Krugovoy, Kurth, Rose, Voet

Space Use and Energy Conservation

CHEESMAN, Heintz, Leff, Mullins, Orthlieb, Raymond, Redgrave

Teacher Education

TRAVERS, England, Kemler-Nelson, Maurer, Metzidakis, Savage, R., Schmidt, Wright

Women's Concerns

MURPHY, Blum, Dickerson, Marecek, Shapiro

Secretary to the Faculty

Pack

Parliamentarian

Urban

Standing Committees of the College

Advisory Committee on Resource Use

Faculty members: Hammons (fall semester), Heald, James, Kemler-Nelson, Rosen; Chairman of the Board Committees on: Development, Finance, Instruction and Libraries, Investment, Property, and Student Life; the two Vice Presidents, Provost, and Dean; three students; chaired by the President of the College, with the Assistant to the President as Recording Secretary.

Divisions and Departments

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Art
Constance Cain Hungerford, Chair

Classics
Helen F. North, Chair

English Literature
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Lillian M. Li, Acting Chair (fall)
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II. DIVISION OF THE SOCIAL SCIENCES
Deborah G. Kemler-Nelson, Chair

Economics
Robinson G. Hollister, Jr., Chair

Education (Program)
Eva F. Travers, Program Director

Engineering
Nelson A. Macken, Chair

History
Lillian M. Li, Acting Chair (fall)
Robert S. DuPlessis, Chair (spring)

Linguistics (Program)
Alfred H. Bloom, Program Director

Mathematics
J. Edward Skeath, Chair

Philosophy
Hans F. Oberdiek, Chair

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David G. Smith, Chair

Psychology
Barry Schwartz, Department Head

Sociology and Anthropology
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III. DIVISION OF THE NATURAL SCIENCES AND ENGINEERING
Mark A. Heald, Chair

Astronomy
Wulff D. Heintz, Acting Chair (fall)
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Biology
Timothy C. Williams, Chair

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Judith G. Voet, Chair (fall)
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Engineering
Nelson A. Macken, Chair

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Administration

PRESIDENT'S OFFICE

David W. Fraser, B.A., Haverford College; M.D., Harvard Medical School, President.

Leah J. Smith, B.A., Stanford University; Ph.D., The Johns Hopkins University, Assistant to the President and Director of Institutional Research.

Christy Ann Fusco, B.A., Swarthmore College, Social Coordinator.

Margaret M. Giovannini, Diane E. Watson, Secretaries.

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Kendall Landis, B.A., Swarthmore College; M.A., Wesleyan University, Vice President – Alumni, Development, Public Relations.

Suzanne P. Welsh, B.A., B.S., University of Delaware; M.B.A., University of Pennsylvania, Assistant Treasurer and Budget Director.

Pauline M. Carroll, Mary C. Kasper, Secretaries.

PROVOST'S OFFICE

James W. England, B.A., Kansas State Teachers College; M.A. and Ph.D., University of Missouri, Provost.

Alfred H. Bloom, B.A., Princeton University; M.A. and Ph.D., Harvard University, Associate Provost, Associate Professor of Linguistics and Psychology and Program Director of Linguistics.

Joanne M. Kimpel, Secretary.

DEAN'S OFFICE

Janet Smith Dickerson, B.A., Western College for Women; M.Ed., Xavier University, Dean of the College.

Elizabeth Chadwick, A.B., Bryn Mawr College; M. Phil. and Ph.D., Yale University, Associate Dean of the College.

Vernon T. Savage, A.B., Syracuse University; M.A. and Ph.D., University of Illinois; Associate Dean; Director of Black and Minority Affairs.

Cigus Vanni, B.A., Swarthmore College, Assistant Dean for New Student Affairs.

Susan Dinsmore Smythe, B.A., Wesleyan University, Coordinator of Student Activities.

Gloria Carey Evans, B.A., Western Washington College of Education; M.S., University of Washington; Ph.D., Stanford University, Consultant for Testing and Guidance and Adviser to Foreign Students.

Alma E. Stewart, Norma Boyle, A.A., Temple University, **Gay M. Jackson,** A.A., Brandywine College, Secretaries.

ADMISSIONS OFFICE

Robert A. Barr, Jr., B.A., Swarthmore College; M.A., University of Pennsylvania, Dean of Admissions.

Wallace Ann Ayres, B.A., Swarthmore College; Ed.M., Harvard University, Associate Dean of Admissions.

Administration

Brenda M. Brock, B.A., Earlham College, Associate Dean of Admissions.

Phyllis Hall Raymond, B.A., Indiana University; M.A., Swarthmore College, Associate Dean of Admissions.

David A. Walter, B.S., Swarthmore College; M.Div., Princeton Theological Seminary, Associate Dean of Admissions.

Richard G. DiFeliciantonio, B.A., Swarthmore College; M.A., University of Denver, Assistant Dean of Admissions.

Eric A. Prothero, B.A., Swarthmore College, Assistant Dean of Admissions and Western Regional Representative.

Susan K. Untereker, B.A., Smith College; M.A., Columbia Teachers College, Assistant to the Dean of Admissions.

Joanne Barracliff, Barbara A. Hadly, Agnes Shonert, Secretaries.

Arlene K. Mooshian, B.S., West Chester State College, Receptionist.

ALUMNI RELATIONS AND PUBLIC RELATIONS

Maralyn Orbison Gillespie, B.A., Swarthmore College, Associate Vice President – Alumni Relations, Publications, and Public Relations.

Diane Wilder, B.A., Swarthmore College, Assistant Director of Alumni Relations.

Lorna Greene Shurkin, B.A., Brooklyn College, Director of Public Relations.

Renée Whitham, B.A., Temple University, Assistant Director of Public Relations.

Larry L. Elveru, B.A., University of Minnesota, Director of Publications and Managing Editor of the *Alumni Bulletin.*

Catherine Downing, B.A., Kent State University, Assistant Director of Publications.

Mimi Geiss, Production Manager.

Kathryn Bassett, Alumni Editor.

Ann D. Geer, B.A., Randolph-Macon Woman's College, Assistant.

Elena Covone, Ruthanne Krauss, Secretaries.

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Gordon E. Cheesman, B.S., Swarthmore College, Acting Director of Physical Plant.

Donald V. Kelley, Joseph R. Skinner, Steven F. Wheaton, B.S., University of Vermont, Assistant Directors of Physical Plant, **Ollie Van Dyke,** Acting Assistant Director of Physical Plant.

June M. Carnall, Facilities Coordinator.

Joseph J. Delozier, Jr., Maintenance Supervisor.

Dorothy Dallam, Abbie Jones, Patricia Thompkins, Rachel Williams, Housekeeping Supervisors.

Jacqueline Batker, Purchasing.

Eleanor J. Breischaft, Esther B. Kelley, Marie Ominski, Secretaries.

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Luther Van Ummersen, C.P.A., B.A., Tufts University, Controller.

Louisa Ridgway, B.A., Vassar College, M.B.A., University of Pennsylvania, Associate Controller.

Nancy E. Sheppard, Business Office Manager.

Margaret A. Thompson, Bursar.

Susan S. Verner, B.A., Old Dominion University, Assistant to the Controller.

Ellen R. Augsberger, Jean English, Debra L. Racz, Jean Raisch, Business Office staff.

Lewis T. Cook, Jr., B.A., St. Lawrence University; M.S., Pennsylvania State University, Associate Vice President – Business Affairs.

Judith F. Valori, B.A., University of Maryland, Secretary.

Doris Morrison, Purchasing Assistant.

Christine Hourican, B.A., B.S., Temple University, Manager of Bookstore.

Helen DiFeliciantonio, Director of Stenographic Office.

Joann M. Massary, Helene M. McCann, Diane Stasiunas, Edith R. Woodland, Stenographic staff.

June Tassoni, Supervisor – Post Office.

CAREER PLANNING AND PLACEMENT

H. Thomas Francis, B.A., Kalamazoo College; M.A., Western Michigan University, Director.

Janet Mass, B.A., Hunter College; M.Ed., University of Pennsylvania, Assistant Director.

Julia Lemon, Recruiting Coordinator/ Secretary.

Lorraine V. Rossi, Secretary.

CENTER FOR SOCIAL AND POLICY STUDIES

Gudmund R. Iversen, M.A., University of Michigan; Ph.D., Harvard University, Director.

Naomi Marcus, Secretary.

COMPUTING SERVICES

William C. Ryan, B.A., Swarthmore College, Director of Computing Services.

Jody Ann Malsbury, A.B., Bryn Mawr College, Associate Director.

Jane F. James, B.S., State University of New York at New Paltz, Assistant to the Director.

William E. Conner, Jr., B.A., B.S., Villanova University, Assistant Director – Manager of Operations.

Dave Ruel, B.A., University of New Hampshire, Assistant Director – Manager of Administrative Computing.

Lawrence Ehmer, B.A., Swarthmore College, Programmer/Analyst.

Mary K. Hasbrouck, B.A., Oberlin College, Programmer.

Robin Jacobsen, B.B.S., Temple University, Programmer.

Sarah D. B. Williams, B.S., James Madison University, Microcomputer Specialist.

Alice H. McGovern, B.S., Fordham University, Information Coordinator/Computer Operator.

Lisa Brunner-Bireley, A.A.S., Delaware County Community College, Computer Operator.

Hazel C. Rapp, Secretary.

DEVELOPMENT

John E. Owen, B.A., Earlham College, Associate Vice President – Development.

Bruce D. Abernethy, B.A., Swarthmore College, Assistant Director – Development/West Coast Representative.

Katherine Danser, B.A., Dickinson College; M.S.Ed., Bucknell University, Director of Annual Giving.

Curtis A. Lauber, B.A., Duke University; M.A., Villanova University, Assistant Director – Development.

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Karen Evans, Secretary to the Director of Corporate and Foundation Relations.

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Bonnie B. Harvey, B.A., Swarthmore College, Secretary.

HEALTH AND PSYCHOLOGICAL SERVICES

Worth Health Center

Linda Echols, R.N.], B.S.N., and M.S.N., University of Pennsylvania; CRNP, Johns Hopkins Hospital, Director of Worth Health Center.

Vera Howland, B.S., Widener University, M.D., Hahnemann Medical College, College Physician.

Alan Zweben, B.S., SUNY, Stoney Brook; M.D., New York Medical College, College Physician.

Elissa R. Chansky, R.N., Beth Israel Hospital, **Constance C. Jones,** R.N., Hospital of University of Pennsylvania, **Anne Nichols,** R.N., B.S.N., Gwynedd-Mercy College, **Carol E. Ronan,** R.N., Philadelphia General Hospital, **Barbara A. Smetana,** R.N., College Health Nurse Practitioner, Brigham Young University.

James E. Clark, B.A., West Virginia University; M.D., Jefferson Medical College, Senior College Physician.

Paul S. Zamostien, B.S., Ursinus College; M.D., Jefferson Medical College, Consulting Gynecologist.

Erwin R. Schmidt, Jr., B.S., Yale University; M.D., University of Wisconsin, Consulting Orthopedic Consultant.

Charles D. Hummer, Jr., B.A., Amherst College; M.D., Hahnemann Medical College, Athletic Orthopedic Consultant.

Anita M. Knowles, Health Services Secretary.

Psychological Services

Leighton C. Whitaker, Director. B.A., Swarthmore College; M.A., University of Connecticut; Ph.D., Wayne State University; Diplomate in Clinical Psychology of the American Board of Professional Psychology.

Paula S. Rosen, Clinical Social Worker. B.A., University of Rochester; M.S.S., Bryn Mawr College; Ph.D., Bryn Mawr College Graduate School of Social Work and Social Research.

Patricia L. Elder-Jucker, Clinical Psychologist. A.A., Community College of Philadelphia; B.A., Temple University; M.Ed., Temple University; Ph.D., Temple University.

Jennifer M. Spackman, Clinical Psychology Intern from Hahnemann University. B.A., Simmons College.

Daniel F. O'Neill, Clinical Psychology Intern from Hahnemann University. B.A., Haverford College.

Silas L. Warner, Consulting Psychiatrist. B.S., Princeton University; M.D., Northwestern University; Certified by the American Board of Psychiatry; Dean, Philadelphia Academy of Psychoanalysis.

Elizabeth P. Cozine, Secretary-Receptionist. R.N., Paterson General Hospital.

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Ann S. Blackburn, Secretary to the College Librarian.

Acquisitions

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Elizabeth Amann, B.A., Swarthmore College; M.S. in L.S., Rutgers University; Assistant Acquisitions/Public Services Librarian.

Shirley F. Kirby, B.A., Washington University; Periodicals Assistant.

Pauline Marshall, B.S., Simmons College; Continuations Assistant.

Monique Constantino, Records & Purchasing Assistant.

Minda N. Hart, B.A., Pennsylvania State University; Assistant Periodicals/Assistant Documents.

Rose Marie Johnson, Assistant/ Acquisitions.

Elizabeth Woolson, A.B., Chestnut Hill College, Assistant.

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Anne J. Perkins, Cataloging Assistant.

Netta Shinbaum, B.A., State University of New York–Oswego; Cataloging Assistant.

Anne Swann, B.A., Swarthmore College, Cataloging Assistant.

So-Young Jones, B.A., Euha Womens University, Korea; M.L.S., Simmons College; Cataloging Assistant.

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Susan G. Williamson, B.A., University of California-Berkeley; Ph.D., University of Pennsylvania, Social Sciences Librarian.

Lois G. Peterson, B.A., Oberlin College, Interlibrary Loan Assistant.

Cornell Library

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Meg E. Spencer, B.A., University of Richmond, Assistant.

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Claire B. Shetter, Cataloging Assistant.

Jane M. Thorson, B.A., Goddard College, Program Secretary; **Nancy P. Speers, Ramsay P. Turberg,** B.A., Mount Holyoke College; M.S. in L.S., Drexel University, Assistants.

Kazue Oye, Conservation Assistant.

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Jean R. Soderlund, A.B., Douglass College; Ph.D., Temple University, Curator.

Barbara E. Addison, B.S., University of Wisconsin (Milwaukee); M.S. in Librarianship, University of Wisconsin (Madison), Cataloger.

Eleanor M. Barr, B.A., Mount Holyoke College, M.L.S., University of Pittsburgh, Archivist.

Mary Ellen Clark, B. Mus., West Virginia University, Assistant.

Martha P. Shane, B.A., Swarthmore College, Archivist.

Viola G. Holdsworth, B.S., Westminster College; M.E.D., Temple University, Receptionist.

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Linda D. Miller, A.A.S., Delaware County Community College, B.S., West Chester University, Communications Sergeant.

Michael J. Fitzgerald, Bobby Van Wilson, Sergeants.

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Biology: Henrietta P. Ewing, B.A., *Swarthmore College,* Secretary, George Flickinger, Instrumentation Technician, Ann M. Rawson, B.A., *Swarthmore College,* M.S., *Cornell University,* Laboratory Technician, Debra Farina, B.S., *St. Joseph's University,* Laboratory Technician.

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English Literature: Thelma M. Miller, Secretary.

History: Eleanor W. Bennett, Secretary.

Linguistics: Winnie Vaules, Secretary

Mathematics: Joyce A. Glackin, Secretary.

Modern Languages: Eleonore Baginski, B.S., *St. Joseph's University,* Secretary, Eleanor L. O'Keefe, Language Laboratory Assistant.

Music: Judy Lord, A.A., *Wesley College,* Secretary, Glenn A. Short, A/V Technician.

Philosophy: Sherrill Franklin, B.A., *University of Kansas,* Secretary.

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Political Science: Eleanor Greitzer, Sara-Page White, B.A., *Swarthmore College,* Secretaries.

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Religion: Eileen McElrone, Secretary.

Sociology and Anthropology: Pauline B. Federman, Secretary.

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Art
Professor Stephen Z. Levine, *Bryn Mawr College*
Professor Gerald Silk, *University of Pennsylvania*

Astronomy
Dr. Robert S. Harrington, *U.S. Naval Observatory*
Professor William Herbst, *Wesleyan University*

Biology
Dr. Dick Donham, *University of Delaware*
Professor Ed Gruberg, *Temple University*
Dr. Gregory Guild, *University of Pennsylvania*
Professor Vivianne T. Nachmias, *University of Pennsylvania*
Professor Ronald A. Pieringer, *Temple University*

Chemistry
Professor David Lavallee, *Hunter College of CUNY*
Professor Richard Schultz, *University of Pennsylvania*
Professor Ruth E. Stark, *Amherst College*
Professor Edward R. Thornton, *University of Pennsylvania*

Classics
Professor Julia Gaisser, *Bryn Mawr College*
Professor Rachel Kitzinger, *Vassar College*
Professor Richard Patterson, *Emory University*

Economics
Professor Erwin Blackstone, *Temple University*
Dr. Jeffrey Hammer, *The World Bank*
Professor Holland Hunter, *Haverford College*
Professor Elizabeth Jensen, *Hamilton College*
Professor Jeffrey Miller, *University of Delaware*
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Joanne Salop, *International Monetary Fund*
Professor Kriss Sjoblom, *University of Pennsylvania*
Professor William Stull, *Temple University*
Professor Michael Weinstein, *Haverford College*

English
Professor Margreta DeGrazia, *University of Pennsylvania*
Professor Elin Diamond, *Rutgers University*
Professor Julia Epstein, *Drexel University*
Michael Ferber, *Coalition for New Foreign & Military Policy*
Professor Philip Fisher, *Brandeis University*
Professor Elaine T. Hansen, *Haverford College*
Professor David Kastan, *Dartmouth College*
Professor Vicki Mahaffey, *University of Pennsylvania*
Professor John Matthews, *Boston University*
Professor Alicia Ostriker, *Rutgers University*
Professor Elaine Scarry, *University of Pennsylvania*
Professor Jennifer Wicke, *Yale University*

History
Professor Emeritus Philip Crowl, *U.S. Naval War College*
Professor Lawrence G. Duggan, *University of Delaware*
Professor William Duggan, *Harriman Institute for Advanced Studies*
Dr. Janet Golden, *Wood Institute*
Professor Andrew Lees, *Rutgers University*
Professor David Pong, *University of Delaware*
Professor J. W. Smit, *Columbia University*
Professor Ronald Walters, *Johns Hopkins University*

Linguistics
Professor Sharon Armstrong, *Lafayette College*
Carl Kendall, *A.I.D.*
Professor Gary Milsark, *Temple University*
Professor Muffy E. A. Siegel, *Temple University*

Mathematics
Professor W. Wistar Comfort, *Wesleyan University*
Professor David K. Hildebrand, *Wharton School, University of Pennsylvania*
Professor Paul Klingsberg, *St. Joseph's University*
Professor Marvin Knopp, *Temple University*
Professor Charles Sims, *Rutgers University*

Modern Languages—French
Professor Claudia Reeder, *Bryn Mawr College*

Modern Languages—Spanish
Professor Peter Earle, *University of Pennsylvania*

Philosophy
Professor Sharon Armstrong, *Lafayette College*
Professor Ted Cohen, *University of Chicago*
Professor Geoffrey Joseph, *University of Southern California*
Professor William McBride, *Purdue University*
Professor Richard Patterson, *Emory University*

Professor David Rosenthal, *City University of New York*

Physics

Professor Neal B. Abraham, *Bryn Mawr College*
Professor Ralph Baierlein, *Wesleyan University*
Professor Robert Hilborn, *Oberlin College*

Political Science

Professor Douglas Bennett, *Temple University*
Professor Nancy Bermeo, *Princeton University*
Professor Thomas Bossert, *Sarah Lawrence College*
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Professor John Waterbury, *Woodrow Wilson School of Public & International Affairs*

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Professor Sharon Armstrong, *Lafayette College*
Dr. Robert Becklen, *Sarah Lawrence College*
Dr. Douglas Davis, *Haverford College*
Dr. Jill Morawski, *Wesleyan University*
Dr. Glen Rosen, *Wellesley College*
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Dr. Alan Silberberg, *The American University*
Professor J. David Smith, *The New School for Social Research*

Religion

Phillip Berryman
Professor Stephen N. Dunning, *University of Pennsylvania*
Susannah Heschel, *University of Pennsylvania*
Professor Gananath Obeyesekere, *Princeton University*
Professor John P. Reeder, *Brown University*
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James Tanis, *Bryn Mawr College*

Sociology & Anthropology

Professor Christine Fry, *Loyola University of Chicago*
Carl Kendall, *A.I.D.*
Professor Gananath Obeyesekere, *Princeton University*
Professor Magali Sarfatti-Larson, *Temple University*
Professor Barry Schwartz, *University of Georgia*
Professor Carmen Sirianni, *Northeastern University*
Professor R. Stephen Warner, *University of Illinois*

Degrees Conferred

June 3, 1985

BACHELOR OF ARTS

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Bruce Davenport Abernethy, *Economics*
Franz Gustave Amador, *Biology*
Steven Scott Anderson, *Sociology & Anthropology*
Jean-Louis Leslie Arcand, *Economics*
Pedro Pablo Auger, *Economics*
Benjamin Tom Backus, *Mathematics*
Charles Swigart Barker, *English Literature*
Ned Elliot Barlas, *Economics*
Stephen Blake Barnard, *English Literature*
Andrew Benjamin Becker, *Biology*
David Anton Bedell, *Special Major: Linguistics with Computer Applications*
Frances Belkin[5], *Psychology*
Arthur Francis Bergh, *Chemistry*
Jay Garrett Black, *Psychology*
Leslie Frances Blum, *Biology*
Pierre Roger Bonenberger, *Economics*
Lisa B. Boots, *Biology*
Jan Boswinkel, *Economics*
Daniel Blain Brandt, *Economics*
Julie Anne Brill, *Biology*
Boyd Janney Brown II, *Economics*
Suzanne Buckley, *Mathematics*
Sonia Isabel Burgueno, *English Literature*
Maria Michele Cancian, *Sociology & Anthropology*
John Charles Caparusso, *Economics*
Glen Edgar Carman, *Literature*
Joseph Thomas Carney, *Economics*
Lynn Aarti Chandhok, *English Literature*
Perry Douglas Chang[4], *Economics*
Carol Randolph Chason, *History*
Amanda Newton Cheetham[5], *Biology*
Jonathan David Choi, *Physics*
Michelle D. Chronister, *Psychology*
Jane Elizabeth Clough[3], *Political Science*
William Alan Cohen, *English Literature*
Gregory Joseph Colman, *English Literature*
Janet Marie Conrad, *Physics*
Peter Joseph Coveleski, *Biology*
Sean Patrick Crowley, *Economics*
Tamar Rodeheaver Datan, *Sociology & Anthropology*
Elizabeth Wolfe Davies, *Sociology & Anthropology*
Philip Gerrit DeBaun, *Economics*
Audrey Hope De Silva, *Biology*
Evan Alexander Diamond, *English Literature*
Ann Christine Dibble, *Special Major: Cultural Anthropology*
Joan Carolyn Differding, *Physics*
D. Gene Dillman II, *Biology*
Stephen Gregory DiMagno, *Chemistry*
Jean Marie Di Pirro, *Psychology*
Joanne Mary Dixon, *Psychology*
Keith R. Dolliver[1], *History*
Benjamin George Druss, *Special Major: Psycholinguistics*
Benjamin Ward Dugan, *Philosophy*
Mary Ann Early[5], *Psychology*
Mark Cabot Easton, *History*
Bruce Alan Ehrlich, *Chemistry*
Yvonne Esselen, *French*
Babak Etemad[5], *Biology*
Marian Ann Evans, *Biology*
Sara West Fenander, *Literature*
Margarida M. Simoes Ferreira, *Political Science*
Stephen D. Fisher[4], *Political Science and Psychology*
Michael Edward Frontczak, *Sociology & Anthropology and English Literature with Concentration in Theatre*
Jeffrey Paul Fullam, *Philosophy*
Christy Ann Fusco, *Art History*
John Luke Gallup, *Economics*
Joshua Paul Gamson, *Political Science*
Maria Soledad Garcia, *Biology*
Paul Allen Garrity, *Chemistry*
Antoinette Grace Gifford, *Political Science*
Susan Lee Gigler, *Biology*
Jeffrey Hugh Giles, *Biology*
David Ronald Gill, *Philosophy*
Nancy Elizabeth Goldston, *Political Science*
Joshua Daniel Goodman, *Political Science*
Sheilah Ann Goodman[4], *Special Major: Political Science*
Gordon Allen Govens, *Philosophy*
Erin Patricia Gramling, *Russian*

1 *with the Concentration in Asian Studies*
2 *with the Concentration in Black Studies*
3 *with the Concentration in International Relations*
4 *with the Concentration in Public Policy*
5 *Secondary School Teaching Certificate*

Charles Case Green, *English Literature*
Laura Morgan Green, *English Literature*
Edward Medford Greene, Jr., *Psychology*
James Everett Gregory, *History*
Rebecca Hall, *History*
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Mitchell Steven Hartman, *Religion*
Samia Hasan, *Psychology*
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Susan Kim Hatter, *Psychology*
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Margarethe Abigail Honeywell, *English Literature*
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Laurie Susan Jamieson, *Political Science*
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Tonya Renee Jenkins, *Biology*
Jennifer Johnson, *Philosophy*
Christopher L. Jones, *Economics*
Jay Lewis Junior, *Psychology*
Charles William Kalish, *Psychology*
Kristen Elizabeth Kann, *English Literature*
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Timothy S. Kinnel, *Physics and Mathematics*
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Tom Christopher Klein, *Economics*
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Keith Frasier Koffler, *Political Science*
Hillary Veda Kunins, *Religion*
Bruce Timothy Lamb, *Biology*
Regina Stella Lambert, *Special Major: Biochemistry*
David Keith Landes, *Psychology*
Barbara Susan Jenkins Langford, *Political Science*
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Patricia Christine Lansing[4], *Economics*
Jeffrey Michael Lating, *Psychology*
Allison Kay Lawrence, *Psychology*
In-Ho Lee, *Special Major: Biochemistry*
Patrice Gail Leeds, *Economics*
Eugenia Angela Leemans, *Political Science*
Sarah Denise Leonard, *Sociology & Anthropology*
Carolyn Jane Lesjak, *English Literature*
Daniel Warren Levi, *Mathematics*
Susanna Tracy Levin, *History*
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An-Yu Andrew Liu[1], *Biology*
Michael Alan Locher, *Physics and Sociology & Anthropology*
Jennifer Anne Lombard, *English Literature*
Daniel Adam London, *History*
John Turnbull Longley, *English Literature*
Andre Landsberger Lorch[3], *Economics*
Adam Teller Lottick, *Psychology and Special Major: Biochemistry*
Shannon O'Neill Louden, *Political Science*
Marcus Rafael Luperini, *Physics*
Kathryn Ellen Mahan, *Biology*
David Hugh Malone, *Special Major: Bioanthropology*
Melissa Lee Mandrell, *Special Major: Women's Studies and Religion*
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Claire Regester Mathews, *Sociology & Anthropology*
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Catherine Ann McCulley, *History*
Julieann Grace McGarry, *Political Science*
Thomas Anthony McHugh, *Psychology*
Alison Cochrane McLean, *Art History*
Jan Marie Merin, *English Literature*

1 *with the Concentration in Asian Studies*
2 *with the Concentration in Black Studies*
3 *with the Concentration in International Relations*
4 *with the Concentration in Public Policy*
5 *Secondary School Teaching Certificate*

Degrees Conferred

Jonathan Robert Miller, *English Literature*
Sara Kay Miron, *History*
Timothy Buell Mitchell, *Physics*
Laura Ashley Moody, *Russian*
Timothy George Oakes Morford, *History*
Andrew Rolf Morral, *Sociology & Anthropology*
Deirdre Ruth Murano, *French*
Stratis Narliotis, *Sociology & Anthropology*
Renato Negrin[3], *Economics*
Phillip Louis Neiman, *Economics*
Valerie Jean Newman, *Biology*
Christopher John Nolan, *Political Science*
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Andrea Covington Packard, *English Literature*
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Cynthia Lynn Palman, *Biology*
Candace Lee Patmore, *Economics*
Paul David Patton, *English Literature and Political Science*
Christopher P. Perkins, *Biology*
Geoffrey Charles Phelps, *English Literature*
David Lawrence Pike, *Special Major: Film, Literature and Critical Theory*
Kenneth Daniel Pitts[5], *Psychology*
Susan Poser, *Greek*
John Michael Proeller, *Religion*
Eric Anderson Prothero, *Economics*
Judith M. Rachel, *English Literature with Concentration in Theatre*
Raissa Ingrid Radell, *Art History*
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Michael Anthony Reil, *Psychology*
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Karen Abby Rosenthal, *Psychology*
Molly Dulcinea Roth, *History*
Donald Gordon Rowe, *English Literature*
James Andrew Rowley, *Biology*
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Ruwan Navindra Salgado, *Economics*
Steven Richard Salovitch, *Economics*
Mary Susanna Salter, *Biology*
Dorris Annette Sampson[2], *Political Science*
Sarah Jean Sangree, *Psychology*
Yatin Pratap Saraiya, *Mathematics*
Sandra Marie Sarro, *Psychology*
Sanjaya Saxena, *Psychology*
Holly Renee Scheider, *Special Major: Women's Studies*
Philip Abraham Schnyder, *Political Science*
Patricia Lynn Scholz[5], *Political Science and Psychology*
Christopher Anand Scott, *Religion*
John Calvin Scott, *Economics*
Jeffrey Todd Seagraves, *Psychology*
Serge Gregory Seiden, *Political Science*
Nina Seigelstein, *History*
Kathleen Marie Sexton, *Psychology*
Steven Richard Shareshian, *Economics and Mathematics*
Antony Michael Sheriff, *Economics*
Melissa Anne Shields, *Economics*
Wayne Alan Shields, *English Literature*
Charles Winton Shrewsbury II, *Music*
Salem David Shuchman, *Political Science*
Rebecca Adams Sielman, *History*
Melanie Carol Smith, *Special Major: Biochemistry*
Elizabeth Ann Snowden, *Chemistry*
Deborah Spielberg, *History*
Timothy Paul Stanion, *English Literature*
Nathan David Stanley, *Philosophy*
Bruce Alan Stern, *Philosophy*
Edward Fredrick Stockburger, *Economics*
Susan Diane Stocker, *Biology*
Pamela Jill Stone, *Literature*
Jan Matias Sundgren, *Economics*
Andrew Hale Sutherland, *Special Major: Physics and Computer Science*
Elizabeth Hamilton Sutherland, *Greek*
Yvonne Annette Tanner, *Biology*
George Brown Telford III, *Political Science*
Nicholas David Cecil Temperley, *History*

1 *with the Concentration in Asian Studies*
2 *with the Concentration in Black Studies*
3 *with the Concentration in International Relations*
4 *with the Concentration in Public Policy*
5 *Secondary School Teaching Certificate*

Gloria Denise Thomas[2], *English Literature*
Abigail Elizabeth Thompson, *Political Science*
Wealthy Ann Thompson, *Religion*
Patricia Marie Jane Thornton[1], *Special Major: Sino-Soviet Studies*
Ida Maria Tikoff[4], *Political Science*
Julia Ruth Toner, *History*
Robert Joseph Toner, *Political Science*
William Wei-Jen Tsai, *Philosophy*
Elizabeth Ann Ure, *Religion*
Elizabeth Regine Varon, *History*
Brian Charles Veen, *Philosophy*
Marya Verhave, *Biology*
Anne Miriam Vigderman, *Special Major: Linguistics and Anthropology*
Lise Rachael Wagner, *Political Science*
Joseph William Walker, *Music*
Karen Elizabeth Walker, *Sociology & Anthropology*
Brian Allen Wall, Jr., *Economics and Psychology*
Thomas Joseph Walsh, *Economics and Psychology*
John Howard Weinstock, *Special Major: Psycholinguistics and its Application to Japanese*
David S. Weiss, *Biology*
Daniel Jacob Weitzner, *Philosophy*
David Paul Weliky, *Chemistry*
Julie Lynn Whitbeck, *Biology*
Gweneth Giles Whitman, *Sociology & Anthropology*
Margaret Grace Williams, *Psychology*
Patrik David Williams[5], *English Literature*
Jennifer Lilian Wilson[5], *Biology*
Ruth Morse Woodliff, *Religion*
Stanton Emerson Fisher Wortham, *Psychology*
Kimberly Elaine Wright[5], *Psychology*
Thomas David Wright, Jr., *English Literature*
Roberta May Hwa Wue, *Art History*
Howard Wuk Yoon, *Chemistry*

BACHELOR OF SCIENCE

Daniel Blain Brandt, *Engineering*
Joseph Thomas Carney, *Engineering*
Bart Edward Cassidy, *Engineering*
Spencer Charles Craig, *Engineering*
Benjamin Ward Dugan, *Engineering*
Susan Patricia Dunning, *Engineering*
Stefan Michael Gabriel, *Engineering*
Tole John Hart, *Engineering*
Marc Alan Hubbard, *Engineering*
Richard Paul Hughey, *Engineering*
Bramley Robert Maber, *Engineering*
Ellen Meeks, *Engineering*
Edward Phillip Morse, *Engineering*
Robert McKinstry Neff, *Engineering*
Stephen Murray Nicolson, *Engineering*
Onuoha Ogbuagu Odim, *Engineering*
Candace Lee Patmore, *Engineering*
Hicham Qadiri, *Engineering*
S. Aileen Read, *Engineering*
Wayne Evans Reeser, *Engineering*
Lee G. Richmond, *Engineering*
Paula Maria Rockovich, *Engineering*
Ruwan Navindra Salgado, *Engineering*
Yatin Pratap Saraiya, *Engineering*
Christopher Anand Scott, *Engineering*
Antony Michael Sheriff, *Engineering*
Steven Mark Silkes, *Engineering*
Edward Fredrick Stockburger, *Engineering*
Jill Lynn Sutherland, *Engineering*
Seow Hwee Tan, *Engineering*
James Howard Willey, Jr., *Engineering*

MASTER OF ARTS

Linda Faulk, *Psychology*

1 *with the Concentration in Asian Studies*
2 *with the Concentration in Black Studies*
3 *with the Concentration in International Relations*
4 *with the Concentration in Public Policy*
5 *Secondary School Teaching Certificate*

Awards and Distinctions

June 3, 1985

HONORS AWARDED BY THE VISITING EXAMINERS—25 MAY 1985

HIGHEST HONORS:
Sara Kay Miron, Stanton Emerson Fisher Wortham.

HIGH HONORS:
Ian Mark Aberbach, Jean-Louis Arcand, Charles Swigart Barker, John Caparusso, William Alan Cohen, Elizabeth Wolfe Davies, Keith R. Dolliver, Margarida Ferreira, John Luke Gallup, Laura Morgan Green, Daniel Parth Ifft, Charles William Kalish, Kristen Elizabeth Kann, An-Yu Andrew Liu, Laura Miriam Markowitz, Claire Regester Mathews, Andrew Rolf Morral, Phillip Neiman, Thomas Walton Roby V, Lourdes Maria Rosado, Jan Matias Sundgren, William Wei-Jen Tsai, Elizabeth Regine Varon, Brian Veen, David Paul Weliky.

HONORS:
Edwin George Abel III, Bruce Davenport Abernethy, Pedro Auger, Benjamin Tom Backus, Stephen Blake Barnard, Jan Boswinkel, Sonia Isabel Burgueno, Maria Michele Cancian, Lynn Chandhok, Perry Douglas Chang, Tamar Rodeheaver Datan, Mark Cabot Easton, Joshua Goodman, Barbara Jill Harris, Sarah Beth Hufbauer, Laurie Susan Jamieson, Michael H. Keene, Jonathan Sidway Kimmel, Tom Christopher Klein, David Keith Landes, Carolyn Lesjak, Daniel London, Timothy Buell Mitchell, Christopher Nolan, Paul von Hartz Owens, Andrea Parkard, Susan Poser, William James Reese, Adam Andersen Reeves, Molly Dulcinea Roth, Steven Richard Salovitch, Serge Seiden, Salem Shuchman, Timothy Stanion, Nathan David Stanley, Bruce Alan Stern, Elizabeth Hamilton Sutherland, Thomas Wright, Howard Wuk Yoon.

DISTINCTION IN COURSE AWARDED BY FACULTY

Franz Gustave Amador, Andrew Benjamin Becker, David Anton Bedell, Daniel Blain Brandt, Julie Anne Brill, Janet Marie Conrad, Benjamin George Druss, Sara West Fenander, Stephen D. Fisher, Stefan Michael Gabriel, Joshua Paul Gamson, Paul Allen Garrity, Susan Kim Hatter, Jeffrey Ewing Herrick, Richard Paul Hughey, Christopher L. Jones, Mary Lee Kelly, Liza Beth Knapp, Robert McKinstry Neff, Paul David Patton, David Lawrence Pike, Eric Anderson Prothero, James Andrew Rowley, Christine Marie Sadowski, Mary Susanna Salter, Yatin Pratap Saraiya, Christopher Anand Scott, Steven Richard Shareshian, Rebecca Adams Sielman, Melanie Carol Smith, Elizabeth Ann Snowden, Susan Diane Stocker, Jill Lynn Sutherland, Seow Hwee Tan, Nicholas David Cecil Temperley, Marya Verhave, Anne Miriam Vigderman, John Howard Weinstock, David S. Weiss, Julie Lynn Whitbeck, Kimberly Elaine Wright.

ELECTIONS TO HONORARY SOCIETIES

PHI BETA KAPPA:
Edwin George Abel III, Ian Mark Aberbach, Franz Gustave Amador, Jean-Louis Leslie Arcand, Benjamin Tom Backus, Charles Swigart Barker, David Anton Bedell, Julie Anne Brill, William Alan Cohen, Janet Marie Conrad, Elizabeth Wolfe Davies, Benjamin George Druss, Stephen D. Fisher, Stefan Michael Gabriel, Joshua Paul Gamson, Paul Allen Garrity, Richard Paul Hughey, Daniel Parth Ifft, Christopher L. Jones, Charles William Kalish, Kristen Elizabeth Kann, Liza Beth Knapp, Claire Regester Mathews, Sara Kay Miron, Robert McKinstry Neff, Phillip Louis Neiman, Valerie Jean Newman, Robert Francis Opet, Cynthia Lynn Palman, Eric Anderson Prothero, Thomas Walton Roby V, Lourdes Maria Rosado, James Andrew Rowley, Christine Marie Sadowski, Mary Susanna Salter, Yatin Pratap Saraiya, Melanie Carol Smith, Elizabeth Ann Snowden, Seow Hwee Tan, Wealthy Ann Thompson, Anne Miriam Vigderman, David S. Weiss, David

Paul Weliky, Stanton Emerson Fisher Wortham, Kimberly Elaine Wright.

SIGMA XI:
Edwin George Abel III, Ian Mark Aberbach, Benjamin Tom Backus, Arthur Francis Bergh, Daniel Blain Brandt, Julie Anne Brill, Jonathan David Choi, Janet Marie Conrad, Stephen Gregory DiMagno, Benjamin George Druss, Bruce Alan Ehrlich, Stefan Michael Gabriel, Paul Allen Garrity, Mark Nadeem Hashim, Jeffrey Ewing Herrick, Richard Paul Hughey, Daniel Parth Ifft, Charles William Kalish, Timothy S. Kinnel, In-Ho Lee, An-Yu Andrew Liu, Timothy Buell Mitchell, Robert McKinstry Neff, Daniel Jon Nordin, Cynthia Lynn Palman, James Andrew Rowley, Yatin Pratap Saraiya, Sanjaya Saxena, Melanie Carol Smith, Elizabeth Ann Snowden, Susan Diane Stocker, Jill Lynn Sutherland, Seow Hwee Tan, David S. Weiss, David Paul Weliky, Julie Lynn Whitbeck, Kimberly Elaine Wright, Howard Wuk Yoon.

TAU BETA PI:
Stefan M. Gabriel, Richard P. Hughey, Robert M. Neff, Yatin P. Saraiya, Antony M. Sheriff, Jill L. Sutherland, Seow Hwee Tan.

FELLOWSHIPS

The Sarah Kaighn Cooper Scholarship to Sean Thomas '86
The Elizabeth Pollard Fetter String Quartet Scholarships to Serena Canin '88, violin; Rani Vaz '87, violin; Kevin Aires '88, viola; Stephen Feldman '88, cello
Friends of Music and Dance Summer Fellowships: for music, Elizabeth Hoffman '85 and Susan Rosenbaum '87; for dance, Margaret Huang '87 and Sally Steffen '87
Phi Beta Kappa Fellowship to James Andrew Rowley '85
The Hannah A. Leedom Fellowship to Lisa Gross '83 and Karen M. Swanson '84
The Lang Graduate Incentive Fellowship to Leslie Blum '85, Lisa Boots '85, and Edward Williamson '85
The Joshua Lippincott Fellowship to Tahir Andrabi '84, Jeffrey Herrick '85, and Patricia Kelly '79
The Thomas M. McCabe, Jr. and Yvonne Motley McCabe Memorial Fellowship to Tamara Weinberg '82 and Richard Yanowitch '81
The Lucretia Mott Fellowship to Claire Mathews '85 and Raissa Radell '85
The Martha E. Tyson Fellowship to Gloria Thomas '85

AWARDS AND PRIZES

The Academy of American Poets Prize to Kirsten Gruesz '86
The Stanley Adamson Prize in Chemistry to Danielle Casher '86
The American Institute of Chemists Award to Elizabeth A. Snowden '85
The American Chemical Society Scholastic Achievement Award to Edwin B. Abel III '85
The Boyd Barnard Award to Melinda Hoyt '86 and Hilary Brest '86
The Paul H. Beik Prize in History to Rebecca A. Sielman '85
The Tim Berman Memorial Award to Bruce Abernethy '85
The Alice L. Crossley Prize to Christopher Scott '85
The Flack Achievement Award to Abraham Nicholas Morse '87
The John Russell Hays Poetry Prizes: for poetry, Alex Gavis '86; for translation, Ian MacInnes '87 and Kairos Shen '87
The Philip M. Hicks Prize to Charles Barker '85
The Jesse H. Holmes Prize in Religion to Claire R. Mathews '85
The Ivy Award to Edwin Abel III '85 and Salem Shuchman '85
The Kwink Trophy to Peter J. Coveleski '85 and Edward F. Stockburger '85
The McCabe Engineering Award to Yatin P. Saraiya '85
The Lois Morrell Poetry Award to Rebecca

Bernard '86 and Susannah Sheffer '87
The A. Edward Newton Library Prize to John Gallup '85, first prize; Jean-Louis Arcand '85, second prize; David W. Vinjamuri '86, third prize
The Oak Leaf Award to Andrea Packard '85
The May E. Parry Memorial Award to Kimberly E. Wright '85
The John W. Perdue Memorial Prize to Carl A. Palmer '86
The William Plumer Potter Prizes in Fiction: Joshua Gamson '85, first prize; Laura Markowitz '85, second prize; Stefan Christian '86, third prize
The Judith Polgar Ruchkin Prize Essay to Joshua Gamson '85
The Rosita Sarnoff Prize for Playwriting: Ian MacInnes '87, first prize; Ben Fulves '87, second prize
The Peter Gram Swing Prize to Charles Shrewsbury '85
The Melvin B. Troy Award to Stephen Dalton '88 and Amelia Rudolph '86

Enrollment Statistics

ENROLLMENT OF STUDENTS BY CLASSES 1984-85

	MEN	WOMEN	TOTAL
Seniors	174	132	306
Juniors	147	120	267
Sophomores	177	160	337
Freshmen	199	195	394
	697	607	1304
Graduate Students	0	1	1
Special Students	10	8	18
TOTAL	707	616	1323

GEOGRAPHICAL DISTRIBUTION OF STUDENTS 1984-85

Pennsylvania	230	Puerto Rico	3	Belgium	2
New York	225	South Carolina	3	Cyprus	2
New Jersey	111	Utah	3	Ghana	2
Maryland	95	West Virginia	3	South Africa	2
California	78	Wyoming	3	Switzerland	2
Massachusetts	78	Alabama	2	Argentina	1
Connecticut	52	Iowa	2	Austria	1
Virginia	35	Kentucky	2	Bangladesh	1
Illinois	29	Louisiana	2	Bolivia	1
Delaware	27	Mississippi	2	Brazil	1
Ohio	27	Nebraska	2	Chile	1
Florida	21	Nevada	2	China	1
District of Columbia	20	Alaska	1	Dominican Republic	1
Texas	19	Arkansas	1	Fiji	1
North Carolina	15	Idaho	1	Indonesia	1
Minnesota	14	Montana	1	Israel	1
Washington	12	South Dakota	2	Korea	1
Michigan	11	Virgin Islands	1	Kuwait	1
Missouri	11	Total U.S.A.	1240	Lebanon	1
Wisconsin	10			Malaysia	1
Maine	9			Morocco	1
Oregon	9			Mozambique	1
Arizona	8	India	7	Netherlands	1
Colorado	8	Canada	6	Norway	1
Vermont	8	France	5	Singapore	1
Georgia	7	Hong Kong	5	Sri Lanka	1
New Mexico	7	Japan	5	Swaziland	1
Rhode Island	7	Greece	4	Venezuela	1
New Hampshire	6	Mexico	4	West Germany	1
Indiana	5	Brazil	3	Total from Abroad	81
Kansas	4	Pakistan	3	GRAND TOTAL	1321
Tennessee	4	Thailand	3		
Oklahoma	3	United Kingdom	3		

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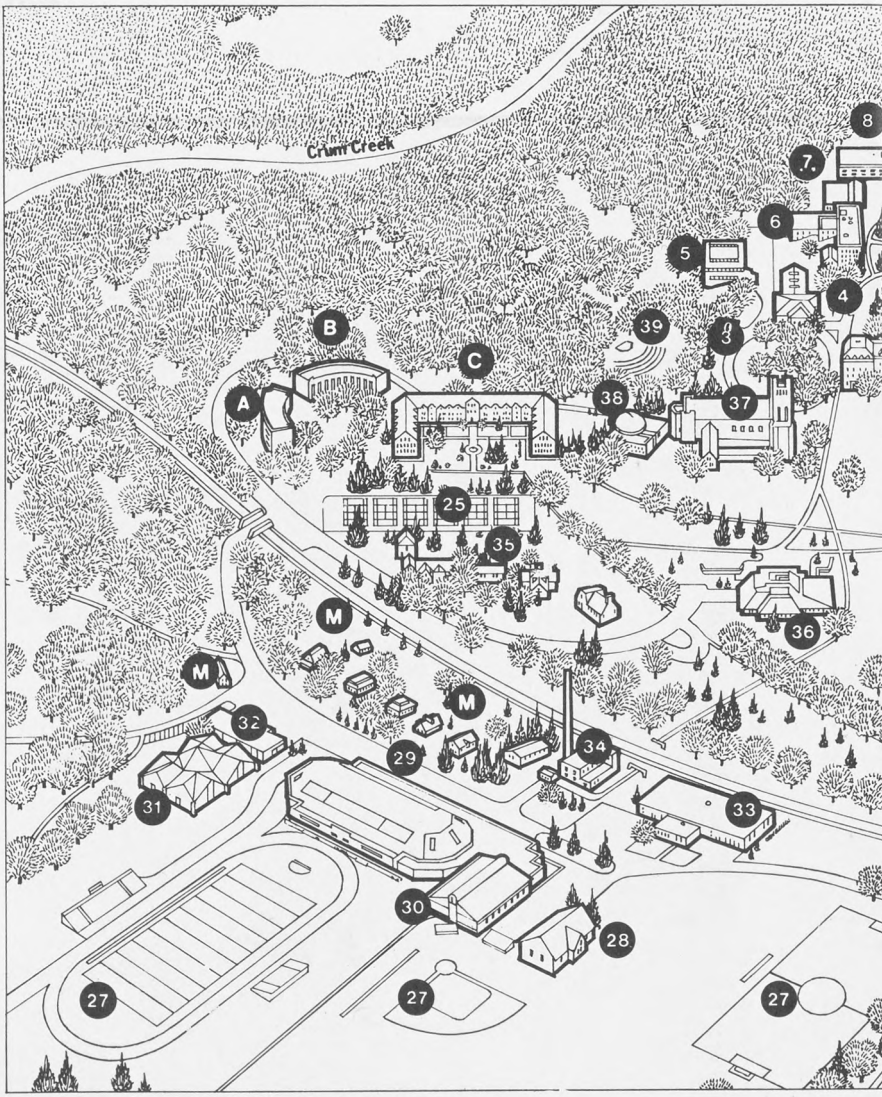
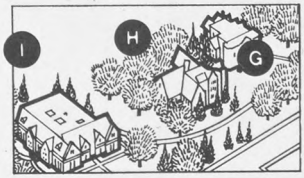
Notes

Notes

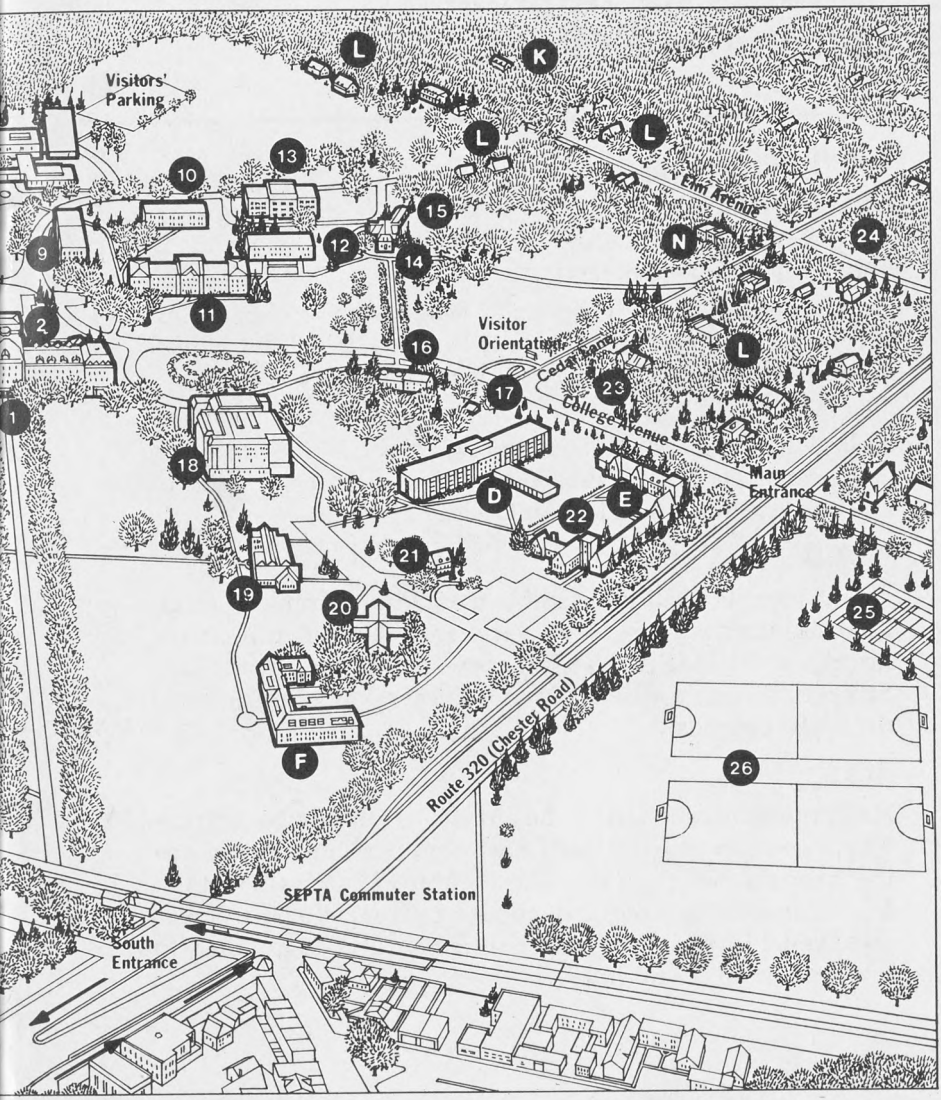
Campus Map





Explanation of Buildings

1. Parrish Hall—*Admissions Office, administration offices, business offices, classrooms, and dormitory*
2. Parrish Annex—*Faculty offices, Communications Center*
3. Scott Foundation Building—*Relief map of campus*
4. Hall Building—*Dance Studios and Security Office*
5. Lang Music Building—*Underhill Music Library, dance, music*
6. Martin Biological Laboratory and Animal Laboratory—*Biology, religion, language laboratory, and education*
7. Cornell Science Library
8. Du Pont Science Building—*Chemistry, mathematics, and physics*
9. Beardsley Hall—*Art history and studio art, Computing Center, and Wilcox Gallery*
10. Hicks Hall—*Engineering*
11. Trotter Hall—*Social sciences and Center for Social and Policy Studies*
12. Arts Center—*Pearson Theatre, drama, and studio arts*
13. Papazian Hall—*Linguistics, philosophy, psychology, and engineering laboratories*
14. Friends Meeting House



5. Whittier House
6. Scott Horticultural Foundation Office
7. Wister Greenhouse
8. McCabe Library
9. Tarble Social Center
0. Worth Health Center
1. Benjamin West House—*Birthplace of Benjamin West (designated a national historical landmark) and faculty residence*
2. Bond Memorial and Lodges—*Dormitory space and meeting rooms*
3. Robinson House—*Black Cultural Center*
4. Ashton Guest House
25. Tennis Courts
26. Cunningham Fields
27. Clothier Fields
28. Barn
29. Lamb-Miller Field House—*Physical education*
30. Tarble Pavilion—*Physical education*
31. Ware Swimming Pool
32. Squash Courts
33. Service Building
34. Heating Plant
35. Fraternity and Social Lodges
36. Sharples Dining Hall
37. Clothier Memorial—*Site of new Social Center*
38. Sproul Observatory—*Astronomy*
39. Scott Outdoor Auditorium

Dormitories and Residences

1. Parrish Hall
A. Dana Dormitory
B. Hallowell Dormitory
C. Wharton Hall
D. Willets Dormitory
E. Worth Dormitory
F. Mertz Hall
G. Palmer Hall
H. Pittenger Hall
I. Roberts Hall
J. Mary Lyon Building
K. Woolman House
L. Professors' Houses
M. Employees' Houses
N. Courtney Smith House—*President's House*

Directions for Reaching Swarthmore College

DRIVING

FROM THE NORTH
Follow NJ Turnpike South to PA Turnpike.

FROM THE PA TURNPIKE
Take Exit 24 (Valley Forge) and follow signs to Schuylkill Expressway (Interstate 76). Take Route 320 South for 14.5 miles to College Avenue. Turn right on College Avenue.

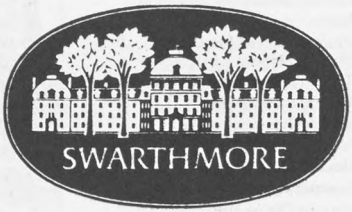
FROM THE SOUTH
Follow Interstate 95 North and take the PA Route 320 Exit in Chester, Pa. Follow PA Route 320 north for 4.1 miles to College Avenue. Turn left on College Avenue.

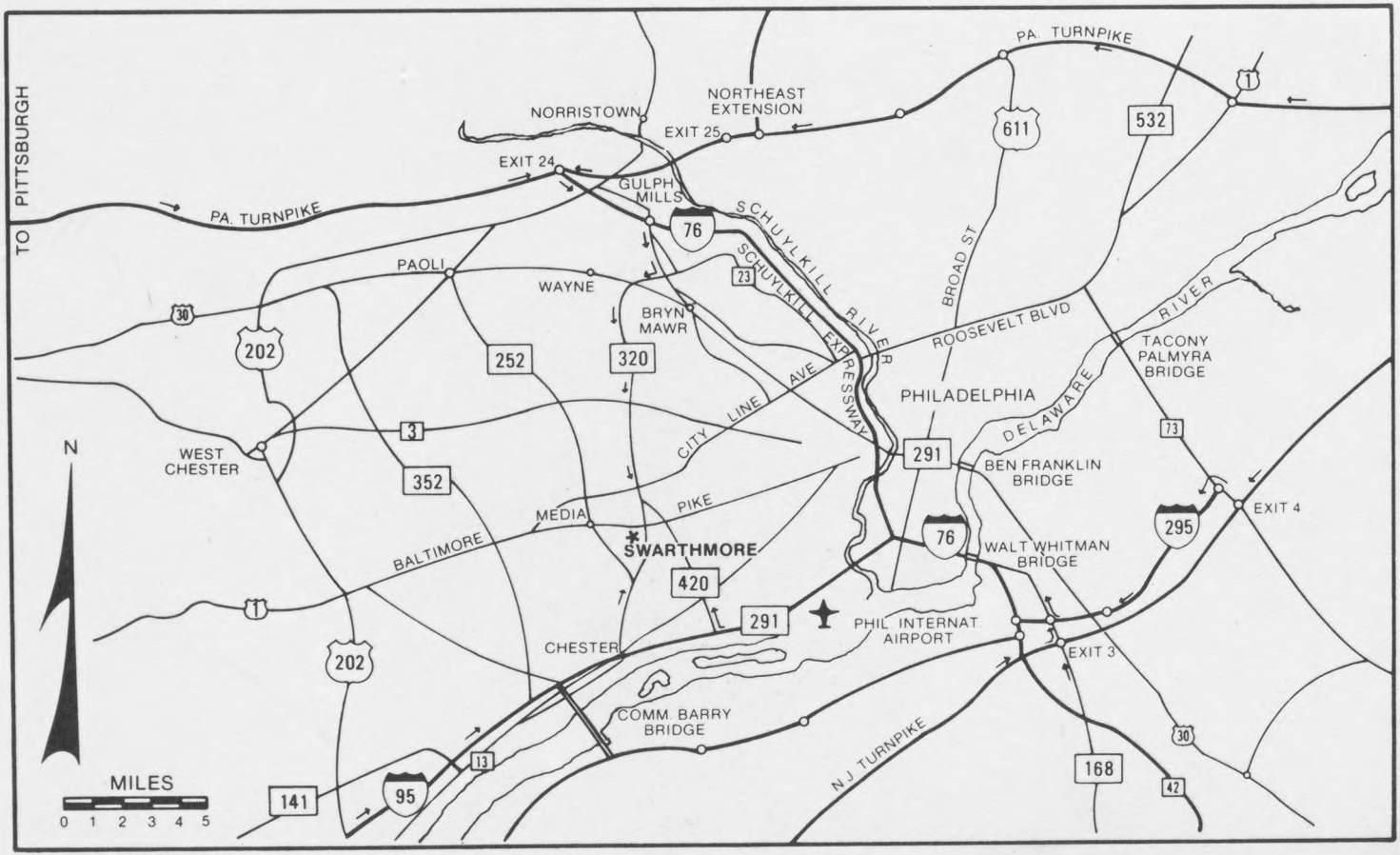
TRAIN

The College is readily accessible from Philadelphia by train. Amtrak trains from New York and Washington arrive hourly at Philadelphia's 30th Street Station. From 30th Street Station, the SEPTA Media Local takes 21 minutes to reach the campus.

AIR

An express bus runs from the airport to 30th Street Station where you can take the SEPTA Media Local train directly to the Swarthmore campus. The combined fare is less than $4.00, and the trip requires about one hour. Taxi service is also available. The fare is approximately $18.00, and the trip requires about 30 minutes.




TO PITTSBURGH
PA. TURNPIKE
NORRISTOWN
NORTHEAST EXTENSION
EXIT 25
EXIT 24
GULPH MILLS
76
PA. TURNPIKE
611
532
1
SCHUYLKILL RIVER
BROAD ST
PAOLI
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320
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CHESTER
EXIT 3
COMM. BARRY BRIDGE
N.J. TURNPIKE
MILES
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