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1971-72

SWARTHMORE COLLEGE BULLETIN

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SWARTHMORE COLLEGE

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BULLETIN

CATALOGUE ISSUE ■ 1971-1972

Volume LXIX ■ Number 1 ■ September 1971

DIRECTIONS FOR CORRESPONDENCE

SWARTHMORE COLLEGE, SWARTHMORE, PA. 19081

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ACADEMIC POLICY	Charles E. Gilbert, <i>Provost</i>
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ALUMNI AFFAIRS AND PUBLIC RELATIONS	Joseph B. Shane, <i>Vice-President</i>
GENERAL INFORMATION	Maralyn Orbison Gillespie, <i>Director of News Office</i>

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College Calendar

1971

Fall Semester

<i>September 14-18</i>	Freshman placement days
<i>September 17</i>	Meeting of Honors students
<i>September 18</i>	Registration
<i>September 20</i>	Classes and Honors seminars begin
<i>October 1</i>	Meeting of the Board of Managers
<i>November 25-27</i>	Thanksgiving recess
<i>December 3, 4</i>	Annual Meeting of the Board of Managers
<i>December 10</i>	Registration for spring semester
<i>December 17</i>	Christmas vacation begins, 6:00 p.m.

1972

<i>January 3</i>	Christmas vacation ends, 8:30 a.m.
<i>January 11</i>	Classes and seminars end
<i>January 13</i>	Mid-year examinations begin
<i>January 20</i>	Meeting of Honors students
<i>January 21</i>	Mid-year examinations end

Spring Semester

<i>January 24</i>	Classes and seminars begin
<i>February 4, 5</i>	Meeting of the Board of Managers
<i>March 17</i>	Spring vacation begins, 6:00 p.m.
<i>March 27</i>	Spring vacation ends, 8:30 a.m.
<i>March 31, April 1</i>	Meeting of the Board of Managers
<i>May 5</i>	Classes and seminars end
<i>May 8</i>	Enrollment in classes for fall semester
<i>May 12</i>	Written Honors examinations begin
<i>May 15-17</i>	Senior comprehensive examinations
<i>May 18</i>	Course examinations begin
<i>May 23</i>	Written Honors examinations end
<i>May 25-27</i>	Oral Honors examinations
<i>May 27</i>	Course examinations end
<i>June 2</i>	Meeting of the Board of Managers
<i>June 3</i>	Alumni Day
<i>June 4</i>	Baccalaureate Day
<i>June 5</i>	Commencement Day

College Calendar (*Tentative*)

1972

Fall Semester

<i>September 5-9</i>	Freshman placement days
<i>September 8</i>	Meeting of Honors students
<i>September 9</i>	Registration
<i>September 11</i>	Classes and Honors seminars begin
<i>October 6, 7</i>	Meeting of the Board of Managers
<i>November 23-26</i>	Thanksgiving recess
<i>December 1, 2</i>	Annual Meeting of the Board of Managers
<i>December 8</i>	Registration for spring semester
<i>December 14</i>	Mid-year examinations begin
<i>December 22</i>	Mid-year examinations end
<i>December 22</i>	Christmas vacation begins, 6:00 p.m.

1973

<i>January 8</i>	Christmas vacation ends, 8:30 a.m.
<i>January 11</i>	Meeting of Honors students
<i>January 12</i>	Classes and seminars end

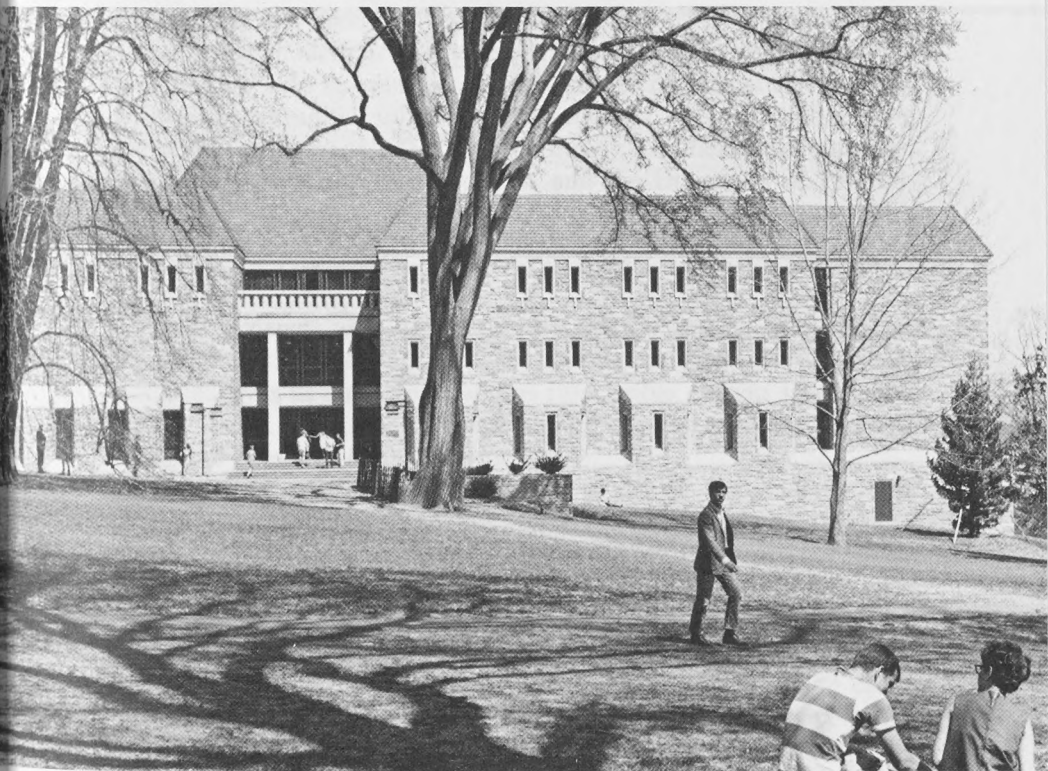
Spring Semester

<i>January 15</i>	Classes and seminars begin
<i>February 2, 3</i>	Meeting of the Board of Managers
<i>March 9</i>	Spring vacation begins, 6:00 p.m.
<i>March 19</i>	Spring vacation ends, 8:30 a.m.
<i>April 6, 7</i>	Meeting of the Board of Managers
<i>April 27</i>	Classes and seminars end
<i>April 30</i>	Enrollment in classes for fall semester
<i>May 4</i>	Written Honors examinations begin
<i>May 7-9</i>	Senior comprehensive examinations
<i>May 10</i>	Course examinations begin
<i>May 15</i>	Written Honors examinations end
<i>May 17-19</i>	Oral Honors examinations
<i>May 19</i>	Course examinations end
<i>May 25</i>	Meeting of the Board of Managers
<i>May 26</i>	Alumni Day
<i>May 27</i>	Baccalaureate Day
<i>May 28</i>	Commencement Day

I

INTRODUCTION TO SWARTHMORE COLLEGE

EDUCATIONAL RESOURCES



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SWARTHMORE COLLEGE
300 WASHINGTON STREET
CAMBRIDGE, MASSACHUSETTS 02142
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INTRODUCTION TO SWARTHMORE COLLEGE

Swarthmore College, founded in 1864 by members of the Religious Society of Friends, is a co-educational college occupying a campus of about 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 1175 students, of whom 525 are women and 650 are men. The borough of Swarthmore is a residential suburb within half an hour's commuting distance of Philadelphia. Because of its location, Swarthmore College students are able to combine the advantages of a semi-rural setting with the opportunities offered by Philadelphia. Especially valuable is the cooperation made possible with three other nearby institutions, Bryn Mawr and Haverford Colleges and the University of Pennsylvania.

OBJECTIVES AND PURPOSES

In accordance with the traditions of its Quaker background, 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. It shares this purpose with other educational institutions, for American education is a direct outgrowth of our democratic principles. While a common purpose underlies all American education, each school and college and university seeks to realize that purpose in its own way. Each must select those tasks it can do best. Only by such selection can it contribute to the diversity and richness of educational opportunity which is part of the American heritage and the American strength.

INTRODUCTION

STANDARDS OF EXCELLENCE

Democracy demands a broad base of intelligent understanding of issues. It also necessitates a high order of excellence in those who are destined to become its leaders. Swarthmore can best serve society by the maintenance of high standards. It is peculiarly fitted by tradition and performance for this essential role, and it is precisely this readiness to do a particular job well that gives the College its value in the educational pattern of American democracy.

Education is largely an individual matter, for no two students are exactly alike. Some need detailed help, while others profit from considerable freedom. The program of Honors study, in which Swarthmore pioneered, is designed to give recognition to this fact. It is the most distinctive feature of the College's educational program. For many students, it provides an enriching and exciting intellectual experience. It has as its main ingredients freedom from ordinary classroom routine, close association with faculty members in small seminars, concentrated work in broad fields of study and maximum latitude for the development of individual responsibility. The Honors program and the Course program are alternative systems of instruction for students during their last two years. Both are designed to evoke the maximum effort and development from each student, the choice of method being determined by individual need and capacity.

THE RELIGIOUS TRADITION

Swarthmore College was founded by members of the Religious Society of Friends, and it seeks to illuminate the life of its students with the spiritual principles of that Society. Although it has been non-sectarian in control since the beginning of the present century, and although the children of Friends compose a minority of the student body, the College seeks to preserve the religious traditions out of which it sprang.

The essence of Quakerism is the individual's responsibility for seeking truth and for applying whatever truth he believes he has found. As a way of life, it 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 duty of man. It does, however, have the two-fold aim of encouraging conscious concern about such questions and unceasing re-examination of any view which may be

INTRODUCTION

held regarding them. That is the kind of ethical and religious character which Swarthmore seeks to develop.

TRADITION AND CHANGE

A college is never static. Its purposes and policies are always changing to meet new demands and new conditions. The founders of Swarthmore would find in it today many features which they never contemplated when they shaped the College in the middle of the nineteenth century. Swarthmore, if it is to remain effective, must be forever changing. The goal is to achieve for each generation, by means appropriate to the times, that unique contribution and that standard of excellence which have been the guiding ideals of Swarthmore from its founding.

In the spring and summer of 1966 a Commission on Educational Policy and two other special committees were appointed to study various aspects of the College program and to seek ways of strengthening the educational experiences of Swarthmore students. Their reports, including many specific recommendations, were published in the volume, *Critique of a College*, which appeared in December 1967. During the rest of the college year these reports and recommendations were carefully considered by all sections of the College community. Many of the specific recommendations were approved and have been carried into effect.

EDUCATIONAL RESOURCES

PHYSICAL FACILITIES

The primary educational resources of any college are the quality of its faculty and the spirit of the institution. Second to these are the physical facilities, in particular the libraries, laboratories and equipment.

Laboratories, well equipped for undergraduate instruction and in some cases for research, exist in physics, chemistry, zoology, botany, psychology, astronomy, and in civil, mechanical and electrical engineering. The 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 psychology, zoology, botany, and pre-medical studies. The Pierre S. du Pont Science Building, completed in 1960, provides accommodations for chemistry, mathematics, and physics. Beardsley and Hicks Halls contain the engineering laboratories.

The Language Laboratory in Beardsley Hall, made possible by a contribution from the James Foundation of New York, was installed in 1964. It provides stations for 35 students and has the equipment for effective use in language teaching.

The Arts Center, opened in 1961, contains the Paul M. Pearson Experimental Theater, the Florence Wilcox Lobby for art exhibitions, and studios for various arts and crafts.

The Computer Center, located in Beardsley Hall, is furnished with an IBM 1130 computer and appropriate supporting equipment. It is available to students and faculty members for research and instruction, and its use by students is encouraged. Students and faculty members also have remote access to IBM 360 facilities within the Philadelphia region.

The Bartol Research Foundation of the Franklin Institute, which is

EDUCATIONAL RESOURCES

also located on the campus, enjoys an international reputation for its basic research activities in physics, particularly in the fields of nuclear physics, cosmic radiation, solid state physics, and astronomy. Through its affiliation with Thomas Jefferson University, Bartol offers a program of study leading to the Ph.D. degree.

The Thomas B. and Jeannette E. L. McCabe Library contains reading rooms, offices and the major portion of the College library collection. Total College library holdings amount to 350,000 volumes. Some 15,000 volumes are added annually. About 1,500 periodicals are received regularly. The general collection, including all but the scientific and technical books and journals, is housed in the library building, situated on the front campus. The Du Pont Science Library houses some 26,100 books and journals in chemistry, engineering, mathematics and physics. The library is definitely a collection of books and journals for undergraduate use. The demands of Honors work, however, make necessary the provision of large quantities of source material not usually found in collections maintained for undergraduates. It is a point of library policy to try to supply, either by purchase or through inter-library loan, the books needed by students or members of the faculty for their individual research.

SPECIAL COLLECTIONS

In addition, the library contains certain special collections—the British Americana collection, the Wells Wordsworth and Thomson collections, the Auden collection, the Bathe collection of technological history, and a collection of the issuances of 565 private presses.

A number of special features enrich the academic background of the college. Among these are the following:

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 have been deposited; many of them have been reproduced on microfilm, for which four reading machines are available. The William Wade Hinshaw Index to Quaker Meeting Records indexes the material of genealogical interest in the records of 307 meetings in various parts of the United States. Notable among the other holdings are the Whittier Collection (first

EDUCATIONAL RESOURCES

editions and manuscripts of John Greenleaf Whittier, the Quaker poet), the Mott Manuscripts (over 400 autograph letters of Lucretia Mott, antislavery and women's rights leader), and the Hicks Manuscripts (more than 300 letters of Elias Hicks, a famous Quaker minister). The Library's collection of books and pamphlets by and about Friends numbers approximately 30,000 volumes. About 96 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 and others seeking the records of the Peace Movement. The personal papers of Jane Addams of Hull House, Chicago, (approximately 10,000 items) formed the original nucleus of the Collection, which now contains documentation on the history of the organized peace movement from its beginnings *circa* 1815 to the present time, as well as correspondence and writings of many workers for international peace and arbitration. The Collection includes files of some 1,200 peace periodicals published in the United States and abroad over the past 150 years; approximately 154 such periodicals in eleven languages are currently received from twenty-one countries. This collection is the official depository for the archives of leading peace organizations in the United States. A more nearly complete description of the Collection will be found in the *Guide to the Swarthmore College Peace Collection*, published by the College and available on request.

The Bronson M. Cutting Memorial Collection of Recorded Music was established at Swarthmore College in 1936 by a gift of approximately four thousand phonograph records, a radio-phonograph, books and musical scores, from the family of Bronson Murray Cutting, late Senator from New Mexico. Its object is to make the best recorded music available to the undergraduates, faculty, and friends of Swarthmore College, in cooperation with the work of the college Department of Music. The collection is kept up to date with current additions.

The Potter Collection of Recorded Literature, established in 1950 with accumulated income from the William Plumer Potter Public Speaking Fund, includes a wide variety of recorded poetry, drama and prose. Among the 700 titles on disc and tape are contemporary

EDUCATIONAL RESOURCES

writers reading from and discussing their works; full length versions of Shakespearean plays and other dramatic repertoire; the literature of earlier periods read both in modern English and in the pronunciation of the time; British and American ballads; lyrical verse in musical settings; and recordings of literary programs held at Swarthmore. These materials are used as adjuncts to the study of literature. The collection is housed in the McCabe Library.

The Betty Dougherty Spock Memorial Fund, established through the generosity of friends of the late member of the Class of 1952, provides income for the purchase of dramatic recordings. These are kept with the Potter Collection.

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 sixteen volumes:

Lindsay, Alexander Dunlop. *The Essentials of Democracy*. Philadelphia, University of Pennsylvania Press, 1929.

Lowes, John Livingston. *Geoffrey Chaucer and the Development of His Genius*. New York, Houghton Mifflin Co., 1934.

Weyl, Hermann. *Mind and Nature*. Philadelphia, University of Pennsylvania Press, 1934.

America's Recovery Program, by A. A. Berle, Jr., John Dickinson,

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A. Heath Onthank . . . and others . . . London, New York, etc., Oxford University Press, 1934.

Salter, Arthur S. baron. *World Trade and Its Future*. Philadelphia, University of Pennsylvania Press, 1936.

Madariaga, Salvador de. *Theory and Practice in International Relations*. Philadelphia, University of Pennsylvania Press, 1937.

Streit, Clarence Kirshman. *Union Now; a Proposal for a Federal Union of the Democracies of the North Atlantic*. New York, Harper, 1939.

Krogh, August. *The Comparative Physiology of Respiratory Mechanisms*. Philadelphia, University of Pennsylvania Press, 1941.

Griffith, Ernest Stacey. *The Modern Government in Action*. New York, Columbia University Press, 1942.

Linton, Ralph. *The Cultural Background of Personality*. New York, London, D. Appleton-Century Co., 1945.

Wilcox, Clair, Editor. *Civil Liberties Under Attack*. A series of lectures given in 1950-51. Philadelphia, University of Pennsylvania Press, 1951.

Redfield, Robert. *Peasant Society and Culture; an Anthropological Approach to Civilization*. Chicago, The University of Chicago Press, 1956.

Weatherford, Willis D., Jr., Editor. *The Goals of Higher Education*. A series of lectures given in the spring of 1958. Cambridge: Harvard University Press, 1960.

Lovejoy, Arthur Oncken. *Reflections on Human Nature*. Baltimore: Johns Hopkins University Press, 1961.

Rhys, Hedley H., Editor. *Seventeenth Century Science and the Arts*. Princeton: Princeton University Press, 1962.

Brandt, Richard B., Editor. *Social Justice*. Englewood Cliffs: Prentice-Hall, 1962.

Pennock, James Roland, Editor. *Self-government in Modernizing Nations*. Englewood Cliffs: Prentice-Hall, 1965.

The Arthur Hoyt Scott Horticultural Foundation. About three hundred 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 an horticultural and botanical collection of

EDUCATIONAL RESOURCES

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, shrubs and herbaceous plants which are hardy in the climate of Eastern Pennsylvania and suitable for planting by the average gardener, and to beautify the campus. There are exceptionally fine displays of Japanese cherries, flowering crab apples, magnolias and tree peonies, and a great variety of lilacs, rhododendrons, azaleas, daffodils, irises, herbaceous peonies, and hemerocallis. Many donors have contributed generously to the collections. (For full information see *Bulletin of Swarthmore College*, Vol. xxxvii, No. 5.)

The Boyd and Ruth Barnard Fund for the Advancement of Music at Swarthmore was established in 1964 by two graduates of the College, Mr. and Mrs. Boyd T. Barnard of Rosemont, Pennsylvania. 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. Since 1966 part of the fund has been used to bring to the campus two Associates in Performance who direct the chamber music coaching program in the Department of Music and give weekly concerts of chamber music.

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.

and the study of the Renaissance in the United States. The American Renaissance was a period of intense cultural and intellectual activity in the United States, which was reflected in the work of writers and artists. The American Renaissance was a period of intense cultural and intellectual activity in the United States, which was reflected in the work of writers and artists. The American Renaissance was a period of intense cultural and intellectual activity in the United States, which was reflected in the work of writers and artists.

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II

ADMISSION.
EXPENSES
FINANCIAL AID



Magill Walk and Parrish Hall

ADMISSION
EXPENSES
FINANCIAL AID



ADMISSION

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

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.

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.

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.

Admission to the freshman class is normally based upon the satisfactory completion of a four-year secondary school program preparatory to advanced liberal study. Under exceptional 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.

ADMISSION

2. Recommendations from the school principal, headmaster, or guidance counselor and from two teachers.
3. Rating in the Scholastic Aptitude Test and in three Achievement Tests of the College Entrance Examination Board.
4. Personal interview with one of the Deans or an appointed representative.
5. Reading and experience, both in school and out.

Applicants must have satisfactory standing in school, and in aptitude and achievement tests, and should show strong intellectual interests. They should also give evidence of sturdiness of character, promise of growth, initiative, seriousness of purpose, and a sense of social responsibility. As future members of the college community, they should represent varied interests and backgrounds.

PREPARATION

The College 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 his school advisers. In general, preparation should include:

1. *Skills*: The following skills are essential to success in college work and should be brought to a high level by study and practice throughout the preparatory period.
 - a. The use of the English language with accuracy and effectiveness in reading, writing, and speaking.
 - b. The use of the principles of mathematics.
 - c. The use of one, or two, foreign languages to the point of reading prose of average difficulty. The College encourages students to study at least one language for four years, if possible.
2. *Subjects*: All, or almost all, of the preparatory course should be composed of the subjects listed in the following four groups. Variations of choice and emphasis are acceptable although some work should be taken in each group.

History and Social Studies: African, American, Asian, English, European, and ancient history; political, social, and economic problems of modern society.

Literature and Art: American, English, and foreign literature; music; art.

Natural Science and Mathematics: chemistry, physics, biology, astronomy; algebra, geometry, trigonometry, and calculus.

ADMISSION

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

Languages: English, Latin, Greek, German, French, Spanish, Russian, other European or Oriental languages. Applicants should present the strongest possible command of at least one foreign language.

APPLICATIONS AND EXAMINATIONS

Applications must be initiated prior to January 15, and all applications must be completed by February 1. A personal information form will be sent upon request, and this form should be returned promptly, together with the non-refundable application fee of \$20.00. The College then sends the remainder of the application materials. Applicants are encouraged to complete their applications to the College as early in the fall of their senior year as possible. Although Swarthmore does not have an "early decision" program, preliminary readings of completed applications are made at an early date to determine regional and national award winners.

All applicants for freshman admission are required to 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.

Applicants should take the Scholastic Aptitude Test in November, December, or January of the senior year. Candidates who take Achievement Tests before the senior year may submit the results to the Admissions Office, but it is strongly recommended that the English Composition and at least one other Achievement Test be taken in December or January of the senior year. Neither the Scholastic Aptitude Test nor the Achievement Tests may be taken later than January of the senior year.

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

ADMISSION

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 28-39.

THE INTERVIEW

An admissions interview with a representative of the College is a requirement in making application to Swarthmore. Applicants are expected to 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 the Office of Admissions to arrange a meeting with an alumni representative in their own area. Interviews must be completed before March 1 of the senior year. Scholarship applicants should have their interviews by January 1. Candidates are not interviewed until the latter part of the junior year. Candidates will not be able to have campus interviews from March 1 to May 1 but a tour of the campus may be arranged during this period. Appointments at the College can be made by calling or writing the Office of Admissions, 215-KI 4-7900, Ext. 445.

ADMISSION DECISIONS

Notices of the action of the Admissions Committee will be mailed about April 15.

*To reach the College from the New Jersey Turnpike, motorists should leave by Exit 4 (Camden-Philadelphia Interchange). Turn right on Route 73. In about one hundred feet turn right for Interstate 295 South, and follow signs for Walt Whitman Bridge. After crossing Bridge follow signs for Philadelphia International Airport, Route 291. Follow Route 291 past Airport to 420. Turn right on 420 to Baltimore Pike, turn left and proceed to intersection with Route 320. Turn left and follow signs to the College. From the Pennsylvania Turnpike, take Exit 24 (Valley Forge) on to Interstate 76 (Schuylkill Expressway), take Exit 36 on to Route 320 and follow it south to the campus.

Swarthmore is on the Penn Central Railroad (Media Suburban Line). It is 21 minutes from the 30th Street Station, Philadelphia.

ADMISSION

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.

APPLICATIONS FOR TRANSFER

The college accepts a very limited number of transfer students for enrollment each fall. There are no mid-year admissions. For favorable consideration, applicants for transfer must have had a good scholastic 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.

As a general practice, transfer students are not admitted to advanced standing later than the beginning of the sophomore year. 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 March 15 of the year in which entrance is desired. Decisions on these applications are announced early in June. Only under exceptional circumstances are students admitted for transfer eligible for financial assistance during their first year at Swarthmore.

EXPENSES

TUITION AND FEES

Charges for the academic year 1971-72 (two semesters):

Tuition	\$2,450
General Fee	210
Board and Room.....	1,185
	<hr/>
Total Resident Charges	\$3,845*

While a general charge for board and room is made, this may be divided into \$650 for board and \$535 for room. \$48 of the general fee of \$210 has been designated Student Activity Fee. The balance covers library and laboratory fees, athletic fees, student health services and other items.

Payment of one-half of the total sum is due not later than the first day of classes each semester. Payments received during the first fifteen days after the beginning of classes will be subject to a one per cent late payment fee and any payments received after the fifteen-day period will be subject to a five per cent late payment fee. Bills are mailed before the opening of each term. Payments should be made by check or draft to the order of SWARTHMORE COLLEGE. A student is not a registered student at Swarthmore College, nor on any class roll, until his bill is paid. Correspondence about financial matters should be addressed to Miss Caroline Shero, Associate Controller.

Students who wish to charge Book Store purchases, laboratory breakage fees, etc., may do so by maintaining a student deposit account at the Business Office against which charge checks may be drawn. Cash withdrawals may also be made. Students will be notified when overdrafts occur and no cash withdrawals may be made unless a cash balance is maintained. A minimum deposit of \$100.00

*An advance deposit of \$100 is required of all new students in order to reserve a place in college for the coming year. A similar deposit of \$50 is required of returning students. These deposits are credited against the bill for tuition, board, and room.

EXPENSES

in September is suggested and all students are urged to maintain such an account for their convenience.

No reduction or refunding of tuition can be made on account of absence, illness, voluntary withdrawal, or dismissal from college. No reduction or refund will be made for failure to occupy the room assigned for a given term, nor is the general fee refundable. In case of absence or withdrawal from the college and provided due notice has been given in advance to the Business Office, there will be a refund of two-thirds of the board charge for any time in excess of two weeks. Exceptions will be made for students who are required by the draft to leave during the course of the academic year. In these cases tuition, general fee, board and room charges will be refunded on a pro rata basis.

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 board, room or general fee will be made but if a student is away only for a part of a semester, board may be charged on a pro rata basis by prior arrangement.

TUITION PAYMENT PLAN

Many of the parents of students may wish to pay tuition, fees, and residence charges on a monthly basis. Details of a monthly payment plan offered by the Girard Bank of Philadelphia, Pennsylvania will be furnished by the College prior to issuance of the first semester's bill in September.

ACCIDENT AND SICKNESS INSURANCE

The college makes available both accident and accident and sickness insurance to students through John C. Paige and Co. of Boston, Massachusetts. Accident coverage alone costs \$12.00 per year (12 months) for women, and \$18.00 for men. The combined accident and sickness policy is available at an annual cost of \$32.50 for women and \$36.00 for men. At least accident coverage is required of all students who participate in intercollegiate athletic activities and the combined accident and sickness policy is particularly recommended. Application forms are mailed to all students during the summer.

FINANCIAL AID

The College strives to make it possible for each admitted student to attend Swarthmore, regardless of his financial circumstances. More than thirty-five per cent of the total student body currently receive financial aid from the College in the form of scholarships and loans varying in amount from \$100 to \$4000. Aid from sources outside the College brings to 45 per cent the number of students receiving financial assistance.

A prospective scholarship student must apply for financial aid at the time of his application for admission, but financial need does not adversely influence admissions decisions. Instructions for obtaining and filing a Parents' Confidential Statement with the College Scholarship Service are included on the admissions application. The principles of this agency and careful review of its recommendations by the Committee on Financial Aid determine the amount of aid in each case. Essentially, this amount is the difference between the College budget and a family's anticipated contribution. That contribution is determined by weighing the family's income and assets against demands made upon it by such items as taxes, medical expenses, and other children. It also includes the expectation of \$300 to \$400 from the student's summer earnings as well as a portion of his or her personal savings and assets.

For 1971-72, the college bill, which includes tuition, room and board, and a comprehensive college fee, will be \$3845. The 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.

If a student receives a scholarship from a source other than the College, the College subtracts the amount of that scholarship from his 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 he may receive 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 financial need each year. Early in January the Director of Financial Aid mails to each student a new Parents' Confidential Statement which is analyzed by the College

FINANCIAL AID

Scholarship Service and reviewed by the Committee on Financial Aid along with his personal and academic record. The expected contribution from a student's summer earnings increases by approximately \$100 each year as does the proportion of his expected contribution from savings. A student's aid is not withdrawn unless he no longer demonstrates need. The proportion of grant to loan may vary, however, contingent upon his academic record.

Students who have not previously received financial aid may apply if special circumstances have arisen. First year transfer students are not eligible for scholarships. Students who marry may continue to apply for aid, but a contribution from the parents is expected in an amount equivalent to the contribution were the student single.

For the academic year 1971-72 the College has granted approximately \$800,000 in scholarships. About two-thirds of that sum was provided through the generosity of alumni and friends by special gifts and the endowed scholarships listed below. The Federal government also makes Educational Opportunity Grants available. It is not necessary to apply for a specific scholarship; the Committee on Financial Aid decides who are to receive endowed scholarships and others are helped from general scholarship funds. *Financial need is a requirement for all scholarships listed below unless otherwise indicated.*

Swarthmore College National Scholarships

Swarthmore College awards each year a number of four-year National Scholarships to the men and women entering the freshman class. All candidates for admission to the College may be considered for these scholarships. Based on the general plan of the Rhodes Scholarships, the awards are made to those candidates who, in the opinion of the Committee of Award, rank highest in scholarship, character and personality. Whenever feasible, finalists for National Scholarships will be interviewed by the Committee of Award.

The amount of the annual award varies from \$100 to \$4,000 according to the financial need of the winner. In those cases where there is no financial need, National Scholarships will be awarded on an honorary basis and carry an annual stipend of \$100.

Other Scholarships for Men and Women

The Frank and Marie Aydelotte Scholarship is awarded biennially

FINANCIAL AID

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 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 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 Robert C. Brooks Scholarship was established as a memorial to Professor Brooks by a number of his former students. It is available to a major in Political 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 following their graduation and post-graduate work to serve in those fields. 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 Sarah Antrim Cole Scholarship was founded by her parents in memory of Sarah Antrim Cole of the Class of 1934. It is awarded to a graduate of the Worthington High School, Worthington, Ohio.

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. In making selections the committee will place emphasis on character, personality and ability.

FINANCIAL AID

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 man or woman. In making selections, the committee will place emphasis on character, personality and ability.

The Robert K. Enders Scholarship is to be awarded annually to a senior student who has shown excellence in pursuit of a major in a biological topic, if possible reflecting Dr. Enders' concern for the value of field work.

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

The Flack Achievement Award, presented by the Flack Foundation, one of whose founders is Hertha Eisenmenger Flack of the Class of 1938, is to be 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 and who are dedicated to the basic principles of American democracy and of academic freedom. The awards are not related to need.

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 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 will be 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.

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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. In the absence of a relative it may be awarded at the discretion of the College.

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

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

The Midwest Scholarships are awarded each year to one man and one woman applicant who resides in Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri or Wisconsin. Winners will be selected on the basis of their potential contribution to the academic and extra-curricular life of the College.

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 Minnesota Mining and Manufacturing Company Scholarship is awarded annually to a student selected by the Scholarship Committee.

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 Cornelia Chapman and Nicholas O. Pittenger Scholarship established by her 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 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. Ap-

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plicants who show promise of intellectual attainment based upon sound character and effective personality and who reside in Chester County are given preference.

The RCA Scholarship is awarded to a young man or woman who is making a creditable academic record in the field of science or engineering at the undergraduate level. The appointment is usually made for the junior or senior year.

The Reader's Digest Foundation Endowed Scholarship Fund provides scholarships annually for students selected by the Scholarship Committee.

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. Under the provisions of this scholarship, 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 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 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 Scott Award at Swarthmore. A scholarship established by the Scott Paper Co. of Chester, Pa., in honor of its former president, Arthur Hoyt Scott of the Class of 1895. Given for the first time in 1953, it is awarded annually to an outstanding sophomore who plans to enter business after graduation and who demonstrates the qualities of scholarship, character, personality, leadership, and physical vigor. The award provides the recipient with \$1,500 for each of his last two years in college, regardless of financial need.

The Clinton G. Shafer Scholarship endowed by his family in memory of Clinton G. Shafer, of the Class of 1951, is open to students

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interested in engineering and physical science. The committee in making its selections will have regard for character, personality and leadership.

The Thomas H. and Mary Williams Shoemaker Fund provides scholarships annually for children of Friends.

The Marshall P. Sullivan Scholarship Fund was established by Creth and Sullivan, Inc. in memory of Marshall P. Sullivan of the Class of 1897. Preference will be given to graduates of George School, but if no suitable candidate applies from this school, graduates of other Friends schools or other persons will be eligible.

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. The scholarship is first open to descendants of the late Jonathan K. Taylor. Then, while preference is to be given to members of the Baltimore Yearly Meetings of Friends, it is not to be confined to them when suitable persons in membership cannot be found.

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 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 given by Daniel Underhill '94, in memory of his grandfather, Daniel Underhill, member of the first Board of Managers.

The William Hilles Ward Scholarship in memory of William Hilles Ward of the Class of 1915, is to be awarded annually, preferably to a student who plans to major in science. The committee in making its selection, will have regard for candidates who are most deserving of financial assistance.

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

The Samuel Willets Fund. This fund provides an annual income for scholarships. A portion of the fund is assigned for scholarships in

FINANCIAL AID

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 will be 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 Edward Clarkson Wilson and Elizabeth T. Wilson Scholarship provides financial aid for a deserving student.

An anonymous donor provides a renewable scholarship annually for a member of an underprivileged minority group.

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 Class of 1913 Scholarship Fund.

The Class of 1914 Scholarship Fund.

The Class of 1915 Scholarship Fund.

The Class of 1917 Scholarship Fund.

The William Dorsey Scholarship Fund.

The George Ellsler Scholarship Fund.

The Caroline W. Frame Scholarship Fund.

The Joseph E. Gillingham Fund.

The Thomas L. Leedom Scholarship Fund.

The Li Foundation Scholarship Fund.

The Sarah E. Lippincott Scholarship Fund.

The Mark E. Reeves Scholarship Fund.

The Frank Solomon Memorial Scholarship Fund.

The Mary Sproul Scholarship Fund.

The Helen Squier Scholarship Fund.

The Francis Holmes Strozier Memorial Scholarship Fund.

The Joseph T. Sullivan Scholarship Fund.

The Deborah F. Wharton Scholarship Fund.

The Thomas Woodnutt Scholarship Fund.

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Scholarships for Men

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

The Howard S. Evans 1903 Scholarship provides scholarships for worthy male students. The awards are made to those who stand high in scholarship, character, and personality. Preference is given first to applicants preparing for the ministry of the Episcopal Church, second, to that of other protestant denominations; and third, to those interested in Engineering or Economics.

The Donald Renwick Ferguson Scholarship, established by Mrs. Amy Baker Ferguson, in memory of her husband, Donald Renwick Ferguson, M.D., of the Class of 1912, is awarded to a young man who is looking forward to the study of medicine.

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

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 will be given preference. An award is made annually.

The Thomas B. McCabe Achievement Awards, established by

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Thomas B. McCabe '15, are awarded to freshman men from the Delmarva Peninsula and Northern New England (Maine, New Hampshire, or Vermont) who give promise of leadership. In making selections, the Committee will place emphasis on ability, character, personality, and service to school and community. Two awards, providing a minimum annual grant of \$2,300 (tuition) or up to \$4,120 depending on need, will be made to residents of Delaware or the Eastern Shore counties of Maryland or Virginia. Non-residents attending school in this area are also eligible. One award, providing an annual grant of up to \$4,120 depending on need, will be made to a resident of Maine, New Hampshire, or Vermont.

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 all four undergraduate years.

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 participation in out-of-doors sports or in other ways.

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 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, Pa.

The Philip T. Sharples Scholarship, a four-year scholarship open to entering freshmen, is designed to honor and encourage young men in engineering or physical science. The committee, in making its selections, will have regard for candidates who rank highest in scholarship, character, personality, leadership, and physical vigor. At least one scholarship will be given each year.

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,

FINANCIAL AID

and resides west of the Mississippi River or south of Springfield in the State of Illinois.

Scholarships for Women

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

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 income of the *Kappa Alpha Theta Scholarship Fund*, given by members and friends of the Kappa Alpha Theta Fraternity at Swarthmore, is awarded annually to a woman student.

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

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

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

The Mary Coates Preston Scholarship Fund. A sum of money has been left by 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 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 Annie Shoemaker Scholarship is granted annually to a young woman of the graduating class of Friends Central School, Overbrook,

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

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

LOAN FUNDS

Long term loan funds with generous repayment terms combine with Swarthmore's scholarship program to enable the College to meet the needs of each student, and to give the student a chance to invest in his own future. National Defense Student Loan Funds, established by the 1958 National Defense Education Act, are awarded by the College under the guidelines of the United States Office of Education and its own need determination policies. The College also maintains special loan funds which are listed below. Interest on both National Defense Student Loans and Swarthmore College loans is 3% on the unpaid balance, beginning with the repayment period. Repayment starts nine months after the student terminates his higher education, and may be spread over ten years. A ceiling of \$1000 per year on college administered loans is observed, with loans averaging considerably lower.

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 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

FINANCIAL AID

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 applications are made when students arrive in the Fall. Rates of pay run from \$1.60 to \$2.00 per hour, and it is possible for a student to earn between \$300 and \$600 a year. The Student Employment Office takes financial need into account in assigning jobs, but there are usually jobs for all who wish employment. The Student Employment Office also publicizes local off-campus employment opportunities. Students are generally able to carry a moderate working schedule without detriment to their academic performance.

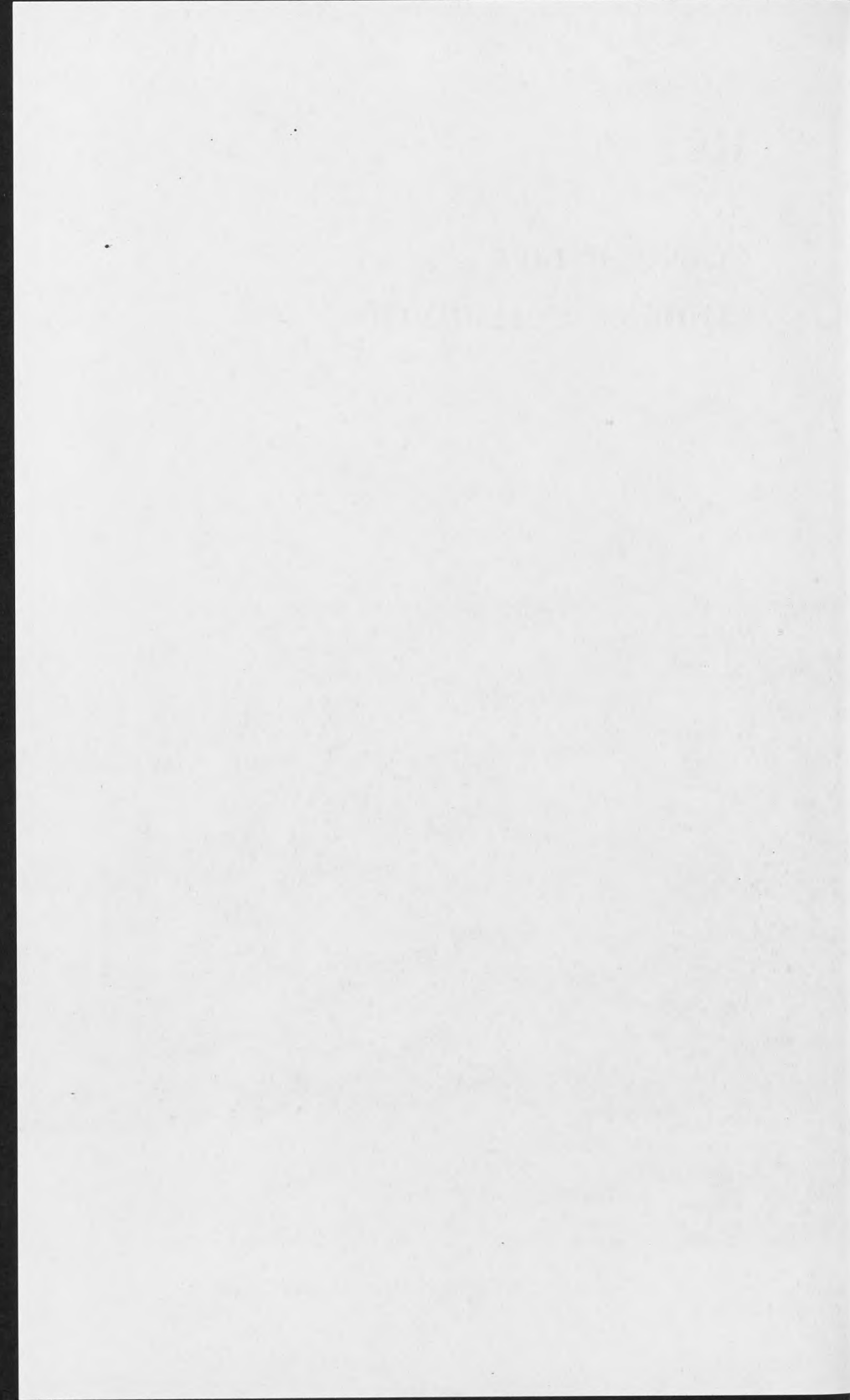
III

COLLEGE LIFE

STUDENT COMMUNITY



Sharples Dining Hall and Clothier Tower



COLLEGE LIFE

HOUSING

Swarthmore is primarily a residential college, conducted on the assumption that an important element in education comes from close association of students and instructors. Most students live in dormitories. Many members of the faculty live on or near the campus.

Residence Halls

There are seven dormitories for men: Wharton Hall, named in honor of its donor, Joseph Wharton, at one time President of the Board of Managers, Palmer and Pittenger Halls on South Chester Road, one building on the former Mary Lyon School property, Ashton House, and two dormitories, Hallowell and Dana, which were opened in September of 1967.

The women's dormitories include the upper floors in the wings of Parrish Hall, Worth Hall, the gift of William P. Worth, '76, and J. Sharples Worth, ex-'73, as a memorial to their parents, Woolman House, and Willets Hall, largely made possible by a bequest from Phebe Seaman, '19, and named in honor of her mother and aunts.

Certain dormitories and dormitory sections are reserved for a program of coeducational housing. These include Roberts Hall, one building in Mary Lyon, two sections of Wharton, two sections of Worth, and one floor of Willets.

The men's and women's dormitories may be visited by members of the opposite sex according to procedures established by the dormitory sections in consultation with the Deans.

All freshmen are assigned to rooms by the Deans. Other students choose their rooms in an order determined by lot. Special permission must be obtained from the Deans to room outside the dormitories.

Students may occupy college rooms during vacations only by special arrangements with the Deans and payment of the required fee. Freshmen, sophomores and juniors are asked to leave college immediately after their last examination in the spring so that their rooms may be used by Commencement visitors.

COLLEGE LIFE

The insurance program for the College is designed to provide protection for College property and does not include the property of students or others. It is therefore suggested that students and their parents should 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 have their meals in the Philip T. Sharples Dining Hall. The dining hall is ordinarily closed during vacations.

Tarble Social Center

Through the generosity of Newton E. Tarble of the Class of 1913, the building which formerly housed the College Library has been completely renovated and serves as the College's Social Center. It includes recreational facilities, lounges, meeting rooms, and a snack bar.

Black Cultural Center

A Black Cultural Center, located in the Caroline Hadley Robinson House, provides a library and various cultural activities of special interest to black students. The program is planned by a committee of black students, faculty, and administration.

RELIGIOUS LIFE

The religious life of the college is founded on the Quaker principle that the seat of spiritual authority lies in the Inner Light of each individual. 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. Episcopal, Presbyterian, Methodist, and Christian Science churches are located in the borough of Swarthmore; other churches and synagogues 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 in religion.

COLLECTION

For many years an assembly of the College, called Collection, has been held at a regular hour several times a term for addresses or spe-

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cial events. Attendance is voluntary. In 1971-72 a series of talks by College faculty members on topics in their fields of professional interest and from their own work, for a general audience, is planned as the principal focus of Collection and as a way of making more widely accessible the intellectual concerns of the faculty. The President will address the first Collection each semester, and there will be an opportunity in each semester for programs sponsored by the Student Council.

STUDENT WELFARE

Health

The college physicians hold daily office hours at the college, where students may consult them without charge. A student should report any illness to the college physicians, but is free to go for treatment to another doctor if he prefers to do so.

At the time of admission each student must present 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. All new students must have been successfully vaccinated against smallpox within five years, in accordance with Pennsylvania State law.

The college physician gives physical examinations to all students at the beginning of each year. There is close cooperation with the Departments of Physical Education. Recommendations for limited activity are made for those students with physical handicaps. In some cases a student may be excused entirely from the requirements of the Physical Education Department.

The Worth Health Center, a gift of the Worth family in memory of William Penn Worth '76 and Caroline Hallowell Worth '79, was opened in September of 1965. It houses offices for the college physicians and nurses, out-patient treatment facilities and rooms for men and women who must remain as in-patients. Registered nurses are on duty under the direction of the college physicians.

Each student is allowed ten days 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,

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but a charge is made for special medicines, certain immunization procedures, and transportation.

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. Accident insurance coverage is, therefore, required for all students participating in athletics and is recommended for all others. (For details see page 27.)

The college psychiatric consultants hold office hours by appointment each week. The purpose of this service is to be of help with personal and emotional problems. The psychiatrists will provide as complete an evaluation of any student as possible. Brief psychotherapy within the limits of available time will be given to students without charge. In instances where longer treatment is needed, an outside psychiatrist will be recommended to the student.

Student Advising

The Deans and their assistants hold the primary responsibility for advising all students. However, there are many other advisers available.

Each freshman is assigned to a faculty member who acts as his course adviser until this responsibility falls to the chairman of the student's major department at the end of his sophomore year. Faculty members have also been appointed as advisers for each of the men's varsity athletic teams. They work closely with the team, attending practices and many of the scheduled contests.

Mrs. Gloria Evans, Consultant for Testing and Guidance, is an experienced counselor who will assist students with problems of academic adjustment, study skills and reading proficiency. She also can give aptitude and interest tests on request. Appointments may be made at her office in Parrish Hall.

Every coeducational and women's living unit has an adult head resident or resident couple. In most instances they are assisted by senior residents and/or proctors who are members of the junior or senior classes. Student proctors are also assigned to each of the men's dormitory sections. In addition, a group of upperclass women is chosen to serve as counselors for freshman women, with several being assigned to each hall.

Career Planning and Placement

Mrs. Judith Katz, Director of Career Planning and Placement, pro-

vides assistance to students in considering how a given major may relate to future employment, choosing an occupation, and locating employment during the summers and upon graduation. She also plans periodic conferences and arranges interviews for students with prospective employers. Appointments may be made with Mrs. Katz at her office in Parrish Hall.

Alumni Office

The Alumni Office keeps records of the addresses of all living graduates and alumni of the college. It helps edit the Swarthmore alumni magazine, and acts as liaison for the college with all alumni and alumni groups, interpreting to them the present plans and policies of the college.

News Office

The News Office does a two-fold job. It helps prepare the several publications put out by the college known as Swarthmore College Bulletins. These include the alumni magazine, the President's Report, the Catalogue, the Student Handbook, and other miscellaneous issues. In addition to this, the News Office, with the assistance of the largely student operated News Bureau, works with the press and other communications media in publicizing news that is of interest to the general public.

STUDENT COMMUNITY

Student Conduct

The influence of the Society of Friends within the College community is one of the important factors in making Swarthmore what it is. 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 Student Council and the Deans. 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. Such cases normally will be decided by the Deans.

3. The use or possession of firearms or other dangerous weapons is not permitted. Firecrackers or other explosives are prohibited. Tampering with fire alarm or prevention equipment is a serious offense.

4. 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.

5. The participation by any student in any disruption or inter-

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ference with the orderly programs, functions, or conduct of College activities of any kind is a serious offense.

Penalties for violations of College regulations such as those listed above are set by judicial committees or the Deans and may involve suspension 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.

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 Budget Committee, which regulates distribution of funds to student groups; the Elections Committee, which supervises procedure in campus elections; and the Social Committee, see below. In addition to these, there are several joint Faculty-Student Committees, whose student membership is appointed by a Student Committee on Committees which acts after consultation with two deans and two members of the faculty.

Judicial Bodies

Two committees have different jurisdictions. The *Student Judiciary Committee*, elected by the entire student body, acts on all 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 and faculty members and the Deans. It deals with and acts upon any violations of rules or standards of conduct that may involve penalties of suspension or expulsion, and upon cases referred or appealed from the Student Judiciary Committee.

Women's Dormitory Councils

There are three women's dormitory councils: one each in Parrish, Willets, and the smaller upperclass women's dormitories. These councils are composed of the Senior Residents who are appointed by the Dean of Women, and the Hall Presidents who are elected by each hall. Each council elects one of its members to serve on the Coordinating Committee which meets regularly with the Dean. It is through the

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Coordinating Committee that certain programs of interest to students can be implemented and dormitory problems often can be resolved.

Social Committee

An extensive program of social activities is managed by the Social Committee appointed by the Student Council. The program is designed to appeal to a wide variety of interests, and is open to all students. There is usually no charge for college social functions.

EXTRA-CURRICULAR ACTIVITIES

In addition to the foregoing organizations, Swarthmore students have an opportunity to participate in a program of extra-curricular activities wide enough to meet every kind of interest. There are more than thirty-five organized activities, not including departmental clubs or political organizations. They vary as greatly as the interests of the students vary, from the Flying Club to the Chess Club, from the Creative Writing Group to the Co-ed Dance Group. The College encourages a student to participate in whatever activity best fits his personal talents and inclinations, believing that satisfactory avocations are a necessary part of life.

The Studio Arts Program

Instruction and facilities in Studio Arts are available on an extra-curricular basis as well as for credit in the academic program of the Art Department. See page 83 for a listing of credit and non-credit courses.

The Wilcox Gallery provides ten to twelve exhibitions a year, which are a direct complement to the program. The works of nationally known painters as well as those of younger artists are exhibited in group and one man shows.

The Marjorie Heilman Visiting Artist Program

Each year a committee of students and faculty members selects an artist to be invited to spend a week at the College. The work of the invited artist is exhibited in the Wilcox Gallery, and he meets and talks with students on an informal basis.

Music

The Department of Music administers and staffs several performing organizations. The College Chorus, directed by Professor Swing, rehearses twice per week for a total of three hours. (The College Singers, a select small chorus drawn from the membership of the Chorus, rehearses an additional hour per week.) The College Orches-

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tra, directed by Mr. Freeman, rehearses twice per week: a two-hour rehearsal for full orchestra and a one-hour rehearsal for strings. Members of the orchestra, other instrumentalists and solo singers can participate in the chamber music coaching program directed by Mr. Kalish and Mr. Zukofsky.

The Chorus and Orchestra give several public concerts per year at the College and at other schools. Selected members of the chamber music coaching program give a public concert in the spring.

All three organizations require auditions for membership.

The Bond Concert Committee, a student organization working with the Department of Music, plans a series of informal Sunday afternoon concerts to accommodate students interested in preparing solo and chamber music performances. These concerts also provide an opportunity for student composers to get public performances.

There are facilities for private practice, and an excellent college record collection. The Cooper Foundation presents a distinguished group of concerts each year on the campus.

Dance

The Department of Physical Education for Women sponsors performance groups in Folk Dance and Modern Dance. Both groups meet regularly each week and give performances throughout the year. In addition, Mrs. Patricia Boyer will offer this year a non-credit course in dance composition.

Drama

Professor Lee Devin is Director of The Theatre. He supervises the drama program, which includes some 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 intercollegiate program must be justified by the contribution 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. The College feels that it is desirable to have as many students as possible competing on its intercollegiate teams.

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Fraternities

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

IV

EDUCATIONAL PROGRAM
FACULTY REGULATIONS
DEGREE REQUIREMENTS
AWARDS AND PRIZES
FELLOWSHIPS



An Honors Seminar

EDUCATIONAL PROGRAM

It is the purpose of the Educational Program to provide for the intellectual and cultural development of the student body. The program is designed to provide a broad and liberal education which will prepare the student for a career in any field of endeavor.

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AWARDS AND PRIZES

FELLOWSHIPS



Students in the library

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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 74).

The selection of a program will depend upon the student's interests and vocational plans. Programs in engineering, pre-medical courses, and chemistry, for example, are the usual preparation for professional work in these fields. Students planning a career in law, business, or government service find majors in the humanities or social sciences of value.

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 our cultural inheritance, with the development of aesthetic, moral, and spiritual values and of analytical abilities.

It is necessary for most students to concern themselves with the problem of making a living. But this concern should not lead them to a specialization that is too early and too narrow. They still have need of broadening the scope of their experience. Particular skills may afford readier access to routine employment, but positions of greater responsibility will be occupied by those who are equipped to think their way through new problems and to conceive of their functions in a larger context of time and place. Liberal education and vocational training may be the joint products of a common process, and the courses here offered should be selected with this large purpose in view.

*For groupings of departments, see page 219.

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All students during the first half of their college program 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 faculty adviser.

The program for upper class students affords a choice between two methods of study: Honors work and the Course program. An Honors student concentrates on two or three fields, his major and one or more minors, which he studies intensively and which occupy three-fourths of his working time during the last two years. At the close of his senior year he takes a series of six examinations given by visiting examiners over this work. In addition he takes four courses, or the equivalent, which provide opportunities for further exploration outside of his Honors program.

A student in the Course program has a somewhat wider freedom of election and takes four courses or their equivalent in each of the last four semesters. Before the end of his senior year he is required to pass a comprehensive examination given by his major department.

The program for engineering students follows a similar basic plan, with certain variations which are explained on page 112. Courses outside the technical fields are spread over all four years.

The course advisers of freshmen and sophomores are members of the faculty appointed by the Associate Provost. For juniors and seniors the advisers are the chairmen of their major departments or their representatives.

PROGRAM FOR FRESHMEN AND SOPHOMORES

The curriculum of the first two years introduces a student to the methods and content of a variety of fields important to a liberal education.

I. To meet the distribution requirements of the College, a student must take at least two courses from each of the four groups listed below and must elect work in at least six departments. Subject to the restrictions indicated here, students may receive credit toward distribution through taking any numbered course in a given department that they are eligible to take. Mathematics, though not one of the subjects included in the four groups, may be counted as one of the six departments.

1. Astronomy, Biology, Chemistry, Engineering, Physics.
2. Art (courses in art history), Classics (literature courses numbered 11 or above), English Literature (except courses numbered 70-79),

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Modern Languages (literature courses numbered 11 or above), Music (except courses numbered 34-39).

3. Classics (courses in ancient history), History, Linguistics (except Linguistics 38), Philosophy, Psychology, Religion.
4. Economics, Political Science, Sociology and Anthropology.

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.

It is most desirable that students include in their programs some work in a foreign language. A student who intends to major in one of the natural sciences, mathematics, or engineering should take an appropriate mathematics course in his freshman year.

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.

It is expected that, after satisfying the requirements in the general program of the first two years, the student will devote the remainder of his sophomore year to courses which will prepare him for more advanced study of those subjects which have most interested him and to other courses which will increase the range of his knowledge. He should decide, as early in his sophomore year as possible, upon two or three subjects in which he might like to major and should consult the statements of the departments concerned as to required and recommended courses and supporting subjects.

While faculty advisers assist the student in planning his program so as to develop his talents while meeting academic requirements, it is emphasized that students themselves are individually responsible for the planning of their programs. Faculty advisers, department chairmen, other faculty members, the Deans and the Associate Provost and Registrar are available for information and advice.

Physical education is required of all students (except veterans) in the first two years with certain provisions for exemption. The requirements are stated in full on page 73 and in the statements of the departments of Physical Education.

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.

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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 he take at least twenty courses outside the major field. Before graduation the student must pass a comprehensive examination in his major subject.

A student must choose his major subject at the end of the sophomore year, and apply formally through the Registrar to be accepted by the division concerned. The decision will be based on an estimate of his ability in his major subject as well as on his record. If a student does not secure divisional approval, he cannot be admitted to the junior class.

A student's course adviser during his junior and senior years is the chairman of his major department (or a member of the department designated by the chairman) whose approval he must secure for his 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.

HONORS PROGRAM FOR JUNIORS AND SENIORS

The Honors Program, initiated in 1922 by President Frank Aydellotte and modified most recently in 1968, is a distinctive part of Swarthmore's educational life. It seeks to free from the limitations of classroom routine those students whose maturity, interest, and capacity suit them for independent work. 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) Honors work involves a concentration of the student's attention during his last two years upon a limited field of studies. He normally pursues only two subjects during a semester, thereby avoiding fragmentation of interest. The content of the subject matter field is correspondingly broader, permitting a wide range of reading and investigation and demanding of the student correlations of an independent and searching nature.

(2) Honors work frees the student from periodic examinations, since his thinking is under continual scrutiny by his classmates and instructors. By this program he undertakes to prepare himself to take examinations in six subjects at the close of his senior year. In these he is expected to demonstrate his competence in a field of knowledge rather than simply his mastery of those facts and interpre-

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tations which his instructor has seen fit to present. These examinations, consisting of a three-hour paper in each field, are set by examiners from other institutions who read the papers and then come to the campus to conduct an oral examination of each student, in order to clarify and enlarge the basis of their judgment of his command of his material.

(3) Honors work is customarily carried on in seminars or small classes or in independent projects which may lead to an Honors paper or thesis. 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. Each student has an equal responsibility for the assimilation of the whole of the material and is correspondingly searching in his scrutiny of ideas presented by his fellows or by his instructor. The student is expected to devote half of his working time during a semester to each seminar or course taken in preparation for an Honors paper or examination. No student is permitted under ordinary circumstances to take more than six seminars. He may take fewer than six, since he may prepare in other ways for his Honors examinations.

In practice three avenues toward an Honors degree are open:

(1) The normal program of Honors work 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 his major; in those cases where he offers three subjects in each of two fields, one of them is designated as his major. 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 offered elsewhere and since instruction in some

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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 he incurs by missing both the stimulus and the criticism provided by his fellows 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 Honors program as late as the middle of the senior year. They shall receive no remission of the number of examinations by reason of their preparation in Course but shall be subject to the regulations governing Honors programs of the division concerned. Such students must petition the division for permission to take the Honors examinations and must submit an acceptable list of examinations which they are prepared to take.

A candidate for admission to Honors should consult the chairmen of his prospective major and minor departments during the second semester of his 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 his previous work as indicated by the grades he has received but mainly upon his apparent capacity for assuming the responsibility of Honors work. 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 students are required to take the Honors examinations set at that time for the fields they have studied. These trial papers are read, however, by their instructors, not by the visiting examiners. On the basis of the showing made in these examinations, the student may be advised or even required to return to Course, or he may be warned that he continues in Honors at his own risk. Those students who return to Course under these circumstances or for other reasons will receive grades for the work they have done while reading for Honors, but in no case without taking examinations over the field covered.

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

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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, his papers are returned to his instructors, who decide, under rules of the Faculty, whether he shall be given a degree in Course.

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 personal circumstances warrant a student may lengthen the continuous route to graduation to five years by carrying fewer courses than the norm of four during some or all of his college career: this may occasionally be appropriate for students who enter Swarthmore lacking some elements of the usual preparation for college or who, for other reasons, 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 some instruction off campus or who wish to pursue studio or instrumental work without full credit but with instruction and critical supervision; but such programs in the arts are possible only on application to and selection by the department concerned based on 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. 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.

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 rationale and details of these methods are set out in *Critique of a College* (1967).

The principal forms of individual work are attachments, directed

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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 students it is an alternative to seminars as a preparation for papers; but all students are encouraged to consider it. Students who decide before the middle of the semester to do a half-credit attachment may commonly, with permission, drop 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, 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

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recognize problems in the organization of such courses. The course supervisor consults his department and any other departments concerned (and the Curriculum Committee in the case of an inter-departmental course). He also reviews the course outline and bibliography and qualifications and general eligibility of students proposing to participate in the course. On departmental (or Curriculum Committee) approval 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 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 mid-term, 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 mid-semester) 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) permission of the Curriculum Committee; (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

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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.

INTER-DISCIPLINARY WORK

The requirements of the departmental 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. Except for International Relations, the Mediaeval Studies major, and the Linguistics-Psychology major, the College does not offer inter-departmental majors or, except for Black Studies, formal inter-disciplinary programs short of the major. The programs in Education and in Linguistics have departmental status as to staff, although students do not major in them. It should be recognized that some departments are themselves rather inter-disciplinary in nature; that a number of courses are cross-listed between departments; that each year a few 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. One such concentration is formally provided in the Black Studies program (see page 95). Many other opportunities exist informally—e.g., in comparative literature, in American studies, in Religion and Sociology-Anthropology, in Engineering and Social Sciences, or in Biology and Chemistry. 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. The following listings, which may be expected to change from year to year, reflect currently organized opportunities, although some other possibilities are mentioned with the listings of departmental programs later in the catalogue.

ASIAN STUDIES

Students who wish to undertake work at Swarthmore in Asian studies should be aware of the course and seminar offerings pertaining

EDUCATIONAL PROGRAM

to Asia in a number of departments. The opportunity exists to develop coordinated programs of study of an interdisciplinary nature drawing on Asian materials, in conjunction with a standard department major. Students who wish to explore these possibilities are invited to discuss the matter with either Mr. Yuan (History), Mr. Piker (Sociology-Anthropology), or Mr. Swearer (Religion).

Courses and seminars dealing primarily or exclusively with Asian materials:

Department of Art

51. Far Eastern Art (Mr. Rhys)

Department of History

9. China (Mr. Yuan)
44. Modern China (Mr. Yuan)
45. Modern Japan (Mr. Yuan)
46. Asian Nationalisms (Mr. Yuan)
144. The Modern Far East (Mr. Yuan)

Department of Political Science

19. Comparative Communist Politics (Mr. Lieberthal)
20. Politics of East Asia (Mr. Lieberthal)
107. Comparative Communist Politics (Mr. Lieberthal)

Department of Religion

5. Introduction to Asian Religions (Mr. Swearer)
13. Religion in India and Southeast Asia (Mr. Swearer)
14. Religion in East Asia (Mr. Swearer)
26. Religion as a Cultural Institution: Monasticism (Mr. Swearer)
108. Idealistic Thought of India (Mr. Swearer)

Department of Sociology and Anthropology

64. Colloquium: Theravada Buddhism, A Social History (Mr. Piker)

Courses and seminars which include Asian materials:

Department of Economics

11. Economic Development (Mr. Pack)
47. Marxist Political Economy (Mr. Pryor and Mr. Smith)
106. Comparative Economic Systems (Mr. Pryor)

EDUCATIONAL PROGRAM

109. Economic Development (Mr. Pack)

Department of History

43. Expansion of Europe (Mr. Wright)

Department of Political Science

3. Comparative Politics
18. Politics of Developing Nations (Mr. Hopkins)
47. Marxist Political Economy (Mr. Pryor and Mr. Smith)
109. Political Development (Mr. Hopkins)

Department of Religion

24. Mysticism East and West (Mr. Swearer)

Department of Sociology and Anthropology

23. Comparative Social Organization (Mr. Brow)
29. Sociology of Religion
63. Psychological Anthropology (Mr. Piker)
66. Directed reading on the culture and history of Theravada SE Asia is available with Mr. Piker. Prerequisite: permission.
70. Economic Anthropology (Mr. Brow)
102. Comparative Social Organization (Mr. Brow)
107. Sociology of Religion

PRE-MEDICAL PROGRAM

Students who are considering the possibility of attending medical (or dental) school after graduation from Swarthmore should plan their academic programs carefully to meet the pre-medical requirements, listed below, as well as the general College requirements. Specific requirements of the various medical schools, as well as basic information on other aspects of pre-medical and medical training, can be found in "Admission Requirements of American Medical Colleges" published by the Association of American Medical Colleges. Recent editions of this book are available in the various libraries on the campus. All students planning a medical career should become familiar with this book.

Sophomores, juniors, and seniors will be in contact with the pre-medical consultant who, for 1971-72, will be Professor Jenkins (Biology). It is also the consultant's function to prepare a statement of evaluation and recommendation to each medical school to which the student may apply, basing this statement on all available informa-

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tion, including the student's record and faculty evaluations.

In conference with the student, the faculty adviser maps out a program based on requirements listed below, the college's general requirements, and the particular needs and interests of the student. Beyond these considerations the need for understanding basic social problems, the cultivation of sensitiveness to cultural values, and the values of intensive work in at least one field is kept in mind in mapping an individual program.

The following courses are among the minimum requirements of most medical schools: Biology 1,2; Chemistry 1,2 or 11,12, Chemistry 28,29; Mathematics 3,4 or 5,6; Physics 1,2; English Literature, two semester courses. Some medical schools have foreign language requirements. Advanced work in biology, chemistry and mathematics is recommended depending on the student's program and interests. Medical school requirements are changing rapidly and the student is urged to familiarize himself with the specific requirements of those medical schools in which he is interested.

The work of the junior and senior years may be done in either the Course or the Honors program. Intensive work of the major may be done in any department or the student's choice. Medical schools expect, however, that students majoring in the Divisions of the Humanities or Social Sciences will demonstrate solid competence in the scientific subjects they take.

Although some students have been admitted to medical schools upon the completion of three years of college work, most medical schools strongly advise completion of four years of college, and in practice admit very few with less.

CREATIVE ARTS

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

COOPERATION WITH NEIGHBORING INSTITUTIONS

With the approval of their faculty adviser and the Associate Provost, students may take courses offered by Bryn Mawr or Haverford College or the University of Pennsylvania without the payment of

EDUCATIONAL PROGRAM

extra tuition. This arrangement does not apply to the summer session of the University of Pennsylvania.

Advanced students in the physical sciences and engineering may benefit from the Bartol Research Foundation, located on the campus, which offers a graduate program. (See page 12)

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 supplementary. 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 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 approved 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 Associate Provost and Registrar and by the chairmen of departments concerned, if credit is to be given for courses taken, and students may be asked to take examinations upon their return to the College.

1. *Established Programs.* Students who wish to study abroad under formal academic conditions may apply to one of the programs administered by other American colleges and universities; for example, those of Hamilton College, 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 for details.

2. *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 Associate Provost and the appropriate department head, and 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, however, and anyone who applies for admission directly must be prepared to be refused.

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3. *University of Keele.* For a number of years Swarthmore College and the University of Keele, Staffordshire, England, have had a student exchange each year. A student from Swarthmore is selected for study at Keele by a committee which interviews the applicants. The year at Keele may take the place of the junior year at Swarthmore, though it is often taken as an extra year.

4. *Peaslee Scholarships.* These scholarships, the gift of Amos Peaslee (Class of '07), were instituted in 1953 and are normally awarded each year, preferably to sophomores and juniors, for language study abroad. The scholarships are for a minimum of one semester plus a summer; course credit is given for the work done upon approval of the department concerned.

5. *International Association for the Exchange of Students for Technical Experience.* This program, administered by the Engineers' Joint Council, provides opportunities for engineering and science students to work for engineering firms and laboratories in Europe during summer vacations. Students are paid living expenses by the employing firm in the currency of the country in which they work; they pay their own travel costs. Applications must be made by January 1 for work the following summer, and students are notified of the Association's decision by March 31. For further information, students should consult the Director of Career Planning and Placement.

6. *University of Warwick, England.* A fall semester exchange program for members of the Swarthmore junior class majoring in History and second year students in the School of History at Warwick was inaugurated in 1966.

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 Deans 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 nurses or to the college physician.

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 his 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 change his status and attend classes normally, he must again obtain the instructor's approval.
- 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 performance.
- 4) The final grade will be recorded by the Registrar exactly as if the student had attended classes normally.

FACULTY REGULATIONS

GRADES

Instructors report to the Associate Provost and Registrar's office 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. *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 his 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 the grade given in a course should incorporate a zero for any part of the course not complete by the date of the final examination. The grade *Incomplete* should be given only after consultation with the Registrar and only in cases in which it can be shown that extraordinary circumstances made it impossible for the student to complete his work before the deadline, or in cases in which the instructor wishes to insist on the completion of the work before giving a grade with penalties. If an *Inc.* is received, it must normally be made up in the term immediately following that in which it was incurred. A date is set at the end of the first six weeks of each term when make-up examinations must be taken and late papers submitted. Under special circumstances involving the use of laboratories or attendance at courses not immediately available, a student may secure permission to extend the time for making up an incomplete until the second term following. This permission must be given in writing and filed in the Office of the Registrar. Any not made up within a year from the time it was imposed shall be recorded as *NC* (see above), and cannot be made up.

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). Students may designate four additional courses during the following three semesters to be recorded on a credit/no credit basis.

FACULTY REGULATIONS

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 at the discretion of the Deans when parents request it.

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

REGISTRATION

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

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, he should consult his course adviser and file a petition with the Committee on Academic Requirements.

Applications involving the 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.

A deposit of \$50 is required of all returning students prior to their registration, during the spring semester, for the semester which begins the following fall. This deposit is applied to charges for that fall semester, and will be refunded if the student withdraws from College prior to July 15.

STUDENT LEAVES OF ABSENCE

Student leaves of absence are freely permitted provided the request for leave is received by the date of registration and the student is in good standing. If a student has not registered 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 Deans 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.

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.

FACULTY REGULATIONS

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.

SUMMER SCHOOL WORK

Students desiring to transfer credit from a summer school are required to obtain the endorsement of the chairman of the department concerned before entering upon the work, and after completing the work are required to pass an examination set by the Swarthmore department.

PHYSICAL EDUCATION

Physical education is required of all women and non-veteran men in the freshman and sophomore years, unless an excuse is granted by the college physician. Three periods per week are normally required, but certain provisions for exemption based on achievement are included. If any semester's work of the first two years is failed it shall be repeated in the junior year. No student shall be permitted to enter his senior year with a deficiency in physical education.

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, to minimize temptation and to report any case of cheating to the Deans 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.

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.

DEGREE REQUIREMENTS

BACHELOR OF ARTS AND BACHELOR OF SCIENCE

The degree of Bachelor of Arts and Bachelor of Science are conferred upon students who have met the following requirements for graduation:

1. The candidate must have completed thirty-two courses or their equivalent.
2. He must have an average grade of *C* on the courses counted for graduation.
3. He must have complied with the distribution requirements.
4. He must have met the requirements in the major and supporting fields.
5. He must have passed satisfactorily the comprehensive examinations in his major field or met the standards set by visiting examiners for a degree with Honors.
6. He must have completed four semesters of study at Swarthmore College, two of which have been those of the senior year.
7. He must have completed the physical education requirement set forth on page 73 and in statements of the Physical Education Departments.
8. He must have 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 recommen-

DEGREE REQUIREMENTS

dation from the department or departments concerned, to the Committee on the Master's Degree. 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 his 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 his work was done. He shall be examined by outside examiners, provided that where this procedure is not practicable, exceptions may be made by the Committee on the Master's Degree. 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.

A candidate for the Master's degree will be expected to show before admission to candidacy a competence in those languages deemed by his department or departments most essential for his 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 \$2,300 per year, and the general fee for these students is \$25 per semester.

ADVANCED ENGINEERING DEGREES

The advanced degrees of Mechanical Engineer (M.E.), Electrical Engineer (E.E.), and Civil Engineer (C.E.), may be obtained by graduates who have received their Bachelor's degree in Engineering upon fulfilling the requirements given below:

1. The candidate must have been engaged in engineering work for five years since receiving his first degree.
2. He must have had charge of engineering work and must be in a position of responsibility and trust at the time of application.
3. He must make application and submit an outline of the thesis he expects to present, one full year before the advanced degree is to be conferred.

DEGREE REQUIREMENTS

4. The thesis must be submitted for approval one calendar month before the time of granting the degree.

5. Every candidate shall pay a registration fee of \$5 and an additional fee of \$20 when the degree is conferred.

AWARDS AND PRIZES

The *Ivy Award Fund* was created by a gift from Owen Moon, '94. The income of the fund is placed in the hands of the faculty for award on Commencement Day to a male member of the graduating class. The qualifications for the Ivy Award are similar to those for the Rhodes Scholarships and include (a) qualities of manhood, force of character, and leadership; (b) literary and scholastic ability and attainments. These have been phrased by the donor in the words "leadership based upon character and scholarship."

The *Oak Leaf Award* was established by David Dwight Rowlands of the Class of 1909. It was later permanently endowed in memory of him by Hazel C. Rowlands, '07, and Caroline A. Lukens, '98. The award is made by the faculty each year to the woman member of the Senior Class who is outstanding for loyalty, scholarship and service.

The *McCabe Engineering Award*, founded by Thomas B. McCabe, 1915, is to be 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 *Phi Beta Kappa Prize* is awarded by the Swarthmore Chapter to the member of the junior class who had the best academic record for the first two years. The value of the prize is \$40.

The *Brand Blanshard Prize*, honoring Brand Blandshard, professor of philosophy at Swarthmore from 1925 to 1945, has been established by David H. Scull, of the Class of 1936. The award of \$50 is presented annually to the student who, in the opinion of the department, submits the best essay on any philosophical topic.

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 in the award not merely upon the size of the collec-

AWARDS AND PRIZES

tion but also upon the skill with which the books are selected and upon the owner's knowledge of their subject-matter.

The *Katherine B. Sicard Prize* of \$5, endowed by the Delta Gamma Fraternity in memory of Katherine B. Sicard, '34, is awarded annually to the freshman woman who, in the opinion of the department, shows greatest proficiency in English.

Public Speaking Contests. Prizes for contests in public speaking are provided as follows: The *Ella Frances Bunting Extemporaneous Speaking Fund* awards prizes for the best extemporaneous short speeches. The *Owen Moon Fund* provides the Delta Upsilon Speaking Contests awards for the best prepared speeches on topics of current interest. The *William Plumer Potter Public Speaking Fund*, established in 1927, sponsors a contest in the reading of poetry as well as providing funds for other contests described below and for the collection of recorded literature described on page 51.

Three prizes for the best student-written one-act plays are provided by the *William Plumer Potter Fund*. The winning plays are usually produced during the fall semester by the Little Theater Club.

Prizes for the best student short stories are also awarded from the *William Plumer Potter Fund*.

The *Lois Morrell Poetry Award*, given by her parents in memory of Lois Morrell 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, consisting of \$100, is made in the spring of the year. All entries should be submitted by April 1.

The *John Russell Hayes Poetry Prizes*, of approximately \$25 for a first prize and \$15 for a second prize, are offered for the best original poem or for a translation from any language. Manuscripts should be ready by April 1 of each year.

The *Academy of American Poets* has established at Swarthmore College one of its five-year award programs. The Academy gives \$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 program was initiated in 1967.

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

FELLOWSHIPS

Three fellowships are awarded annually by the faculty, on recommendation of the Committee on Fellowships, to seniors or graduates of the college for the pursuit of advanced work. The proposed program of study must have the approval of the faculty. Applications for fellowships must be in the hands of the committee by April 15. Applicants for any one of these fellowships will be considered for the others as well.

These three fellowships are:

The *Hannah A. Leedom Fellowship* of \$1,100 founded by the bequest of Hannah A. Leedom.

The *Joshua Lippincott Fellowship* of \$1,400, founded by Howard W. Lippincott, of the Class of 1875, in memory of his father.

The *John Lockwood Memorial Fellowship* of \$1,400, 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.

Four other fellowships are open to graduates of Swarthmore College under the conditions described below:

The *Lucretia Mott Fellowship*, founded by the Somerville Literary Society and sustained by the contribution of its life members, yields an annual income of approximately \$1,000. It is awarded each year by a committee of the faculty to a woman graduate of that year who is to pursue advanced study at some other institution approved by this committee.

The *Martha E. Tyson Fellowship*, founded by the Somerville Literary Society in 1913, is sustained by the contributions of life members of the society and yields an income of approximately \$1,000. It is awarded biennially by a committee of the faculty to a woman

FELLOWSHIPS

graduate of that year 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 of Award.

Sigma Xi Research Fellowship. The Swarthmore Chapter of Sigma Xi appoints, from time to time, as funds are available, Fellows with research grants with a maximum value of \$1,000. The holders of this fellowship are usually associates of the chapter who have shown conspicuous ability in graduate studies. The purpose of the chapter in awarding these fellowships is to relieve worthy students from teaching and other distracting duties so that they may concentrate as much as possible upon their research. Applications for these fellowships should be made to the secretary of the chapter not later than the middle of March. Appointments will be announced about the middle of April.

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.

A system of uniform numbering is used in all departments. Courses are numbered as follows:

- 1 to 9—introductory courses
 - 11 to 49—other courses open to students of all classes
 - 51 to 69—advanced courses primarily for Juniors and Seniors.
 - 101 to 199—seminars for Honors students 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.

ART

HEDLEY H. RHYS, *Professor*†
ROBERT M. WALKER, *Professor*
TIMOTHY K. KITAO, *Associate Professor*
JOHN W. WILLIAMS, *Associate Professor and Chairman*
HARRIET SHORR BAGUSKAS, *Artist in Residence*‡
FRANK DOMINGUEZ, *Instructor*
KAREL MIKOLAS, *Instructor*
KIT-YIN TIENG SNYDER, *Associate*

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 traditions, meaning, and historical context of works of art and architecture; studio courses expose the problems of methods, processes and personal resources which arise in the actual creation of objects in various media.

REQUIREMENTS AND RECOMMENDATIONS

Prerequisites: Art 1 is the prerequisite for all other art history courses in the department, except as otherwise noted. Art 71 is the usual prerequisite for studio courses. Majors in Course and majors and minors in Honors must take two courses, one of which must be Art 1. This requirement must be fulfilled before the junior year. It is also strongly recommended that a prospective major take Art 71.

Majors in Course: The program consists of at least eight courses (including Art 1) in the department. At least two courses must be in periods before 1900. Senior Reading (Art 60) is required for graduation.

Majors and Minors in Honors: Majors in Honors must prepare for four papers in the department. A minor in Honors consists of two papers. The seminars offered in any one semester vary according to the requirements of the students and the convenience of the department.

Language Requirements for Graduate Schools: Students are advised that graduate work in art history requires a knowledge of French and German.

1. Introduction to Art History. A critical study of the nature of architecture, sculpture and painting in their historical context.

11. Design in Drawing and Painting. The basic elements of design and their function in drawing and painting. Types of harmony, sequence and balance such as linear, tonal and spatial. The methods of design and representation that char-

‡ Absent on leave, 1971-72.

† Absent on leave, spring semester, 1971-72.

ART

acterize the various historical styles. Practical exercises required demand no special technical aptitude, since the purpose of the course is to develop a critical understanding of drawing and painting and not technical skill.

Spring semester. Not offered in 1971-72. Mr. Rhys.

13. Ancient Art. A study of the ancient civilizations of Egypt and Western Asia as a means of understanding the development of the art and architecture of the Aegean Islands and Mainland Greece up to the year 450 B.C.

Fall semester. Mr. Walker.

16. Medieval Art. A study of major developments in art and architecture from around A.D. 300 to around A.D. 1200.

Fall semester. Mr. Williams.

17. Special Topics in Medieval Art. A concentration on selected aspects of medieval art or architecture, such as the mosaics of Ravenna, Anglo-Irish Illumination, Carolingian Art, Romanesque Art, the Gothic Cathedral. The topic will change from year to year.

Spring semester. Mr. Williams.

18. Renaissance-Baroque Art. A study of European art of the period 1400-1750, the focus varying from year to year between Italian Renaissance Art and Baroque Art. The following topics will be discussed: humanism in art, art as problem-solving, scientific methods in art, the idea of canon and perfection in art, the nature of stylistic changes, historicism, the question of reality and illusion, commerce and consumption of art, the rise of art criticism, the artist's role in the society.

Fall semester. Mr. Kitao.

20. Northern Renaissance Art. A study of the art of France, The Netherlands, and Germany from approximately 1325 to 1550. Each time the course is taught, one area will be selected for special emphasis, for example: manuscripts of the 14th century and the International Gothic Style; Jan van Eyck; Hieronymus Bosch; the development of narrative; Albrecht Dürer; painting of the early 16th century in The Netherlands; Art and the Reformation.

Fall semester. Mr. Walker.

30. Modern Architecture. An introduction to the nature of architecture and the functions of the architect through a study of the developments in European and American building during the late nineteenth and twentieth centuries. The specific influence of economic, technological and social changes upon design and structure. Emphasis placed on the study of original examples in the New York and Philadelphia areas and on the work of such men as Sullivan, Wright, Gropius, Mies van der Rohe, Saarinen and Le Corbusier.

The prerequisite of Art History 1 is waived for students in Engineering.

Spring semester. Mr. Walker.

31. Modern Painting. Important stylistic developments in European painting from the French Revolution through Matisse and Picasso: the meanings of the various movements and their relationship to changing social and political attitudes.

Fall semester. Mr. Rhys.

32. American Art. Architecture, sculpture and painting in North America from the Colonial Period to the present day, their connection with European art and their significance as a reflection of American culture.

Fall semester. Mr. Rhys.

ART

51. Far Eastern Art. An introduction to the history of pictorial art in Asia, especially China and Japan, from the earliest phases and origins of pictorial art in China to new movements in the eighteenth and nineteenth centuries. Iconography, stylistic definition and the treatment of form, color and space as they differ from such concerns in Western art will receive special attention.

Spring semester. Not offered in 1971-72. Mr. Rhys.

55. The Cinema. An introduction to the study of the cinema as art; a historical survey, examination of techniques, theories, critical methods, and special topics, varying from year to year.

Spring semester. Mr. Kitao.

56. The City. A study of visual and physical aspects of our man-made environment—our experiences and use of it, its effect on us, and the nature of its growth and design. It involves perception, analysis, and interpretation of the form, structure, imagery, and dynamics of selected historical and contemporary examples.

Fall semester. Mr. Kitao.

57. Renaissance Tradition in American Cities. A study of the elements of Renaissance and Baroque architecture and planning as they are found in their pristine form in Italy and as they persist in American cities today, especially in Philadelphia and Washington, D.C. Consideration will be given to the problems of conservation and urban development.

Spring semester. Not offered in 1971-72. Mr. Kitao.

58. Special Topics in Renaissance-Baroque Art. A selected topic from European art of the period 1400-1750, which varies from year to year according to the interest of the students: e.g., a particular artist (Leonardo, Michelangelo, Bernini, Rembrandt) and his artistic context, a particular category of objects (statuary, public monuments), a particular theme (Landscape, papal Rome, Art and Science).

Fall semester. Not offered in 1971-72. Mr. Kitao.

60. Senior Reading.

Spring semester. Staff

61-62. Senior Thesis. With the approval of the department a thesis may be written during the senior year.

Fall and spring semester. Staff.

65-66. Colloquium. Subject to be determined.

Spring semester. Not offered in 1971-72. Mr. Williams.

71. Introduction to Studio Arts. A six-hour studio course meeting twice a week with exercises in the visual description of objects and ideas. Attention will be given both to the theoretical aspects of the work and to the development of studio techniques.

Each semester. Staff.

72. Color. An investigation of color. Through work with colored papers the student will explore relationships and the possibilities of creating form through color. Recommended for painting students.

Each semester. Not offered in 1971-71. Mrs. Baguskas.

ART

73. Drawing. Three-hour studio course. The student will be expected to fulfill drawing assignments in addition to work in the class. Introduction to the problems of drawing and to the various drawing media. Emphasis on drawing from the nude figure.

Each semester. Mr. Mikolas.

74. An Introduction to Sculpture. Six-hour studio course. An introduction and approach to the discovery, exploration and practical use of three dimensional form. A course that will allow the student to work directly with some of the basic concepts, forms and materials used in producing sculpture through the use of models and other creative means.

Each semester. Mr. Mikolas.

77. Painting.

Each semester. Mr. Dominguez.

78. Graphics. The student will explore the possibilities of image making through the processes of print making.

Spring semester. Mr. Dominguez.

79. Ceramics. A six-hour, advanced course. Concentration on individual projects, with the emphasis on form and glazing. Instruction in kiln operation. Permission of the department required.

Each semester. Mrs. Snyder.

Pottery. Beginning course. An introduction to the techniques of forming stoneware pottery. Instruction in handbuilding, throwing on the potter's wheel, and glazing. No credit.

Each semester. Mrs. Snyder.

HONORS SEMINARS

101. Ancient Art. A study of the development of the forms of art and architecture as they express the cultural patterns of Ancient Greece from the Bronze Age through the Hellenistic Age.

Fall semester. Mr. Walker.

103. Medieval Art. The development of the forms of Christian art during the Middle Ages from the fourth to the thirteenth century.

Fall semester. Mr. Williams.

104. Renaissance-Baroque Art. A study of European art of the period 1400-1750 the focus varying from year to year between Italian Renaissance Art and Baroque Art. The following topics will be discussed: humanism in art, art as problem-solving, scientific methods in art, the idea of canon and perfection in art, the nature of stylistic changes, historicism, the question of reality and illusion, commerce and consumption of art, the rise of art criticism, the artist's role in the society.

Spring semester. Mr. Kitao.

105. Northern Renaissance Painting. Developments in painting and the graphic arts during the fifteenth and sixteenth centuries in France, the Netherlands and Germany with intensive study of individual masters: Jan van Eyck,

ART

Roger van der Weyden, Jean Fouquet, Albrecht Dürer, Jerome Bosch and Pieter Bruegel.

Fall semester. Mr. Walker.

107. Modern Painting. Important stylistic developments in European painting from the French Revolution through Matisse and Picasso: the meanings of the various movements and their relationship to changing social and political attitudes.

Fall semester. Mr. Rhys.

108. Problems in Twentieth Century Art.

Spring semester. Not offered in 1971-72. Mr. Rhys.

109. Master Print Makers. A consideration of certain problems in the history of the graphic arts. A study of the work of such men as Schongauer, Dürer, Rembrandt, Goya, Daumier, Toulouse-Lautrec, and Picasso for the development of expression in the media of woodcut, engraving, etching, aquatint and lithography. Students work almost exclusively with originals in the Print Room of the Philadelphia Museum and the Lessing J. Rosenwald Collection in Jenkintown.

Spring semester. Mr. Walker.

ASTRONOMY

PETER VAN DE KAMP, *Professor*

Chairman and Director of Sproul Observatory

WULFF D. HEINTZ, *Associate Professor*

JOHN L. HERSHEY, *Research Associate and Lecturer*

SARAH LEE LIPPINCOTT, *Research Associate and Lecturer*

Astronomy deals with the nature of the universe about us and the methods employed to discover the laws underlying the observed phenomena. The elementary courses present the problems in broad outlines and trace the growth of our knowledge of the facts and development of theories. The advanced courses consider some of these problems in detail. The seminars deal primarily with the techniques, methods and problems of the Sproul Observatory research program.

The principal instrument of the Sproul Observatory is the twenty-four-inch visual refractor of thirty-six-foot focal length, used almost exclusively for photography. The instrument, recently renovated, has been in operation since 1912 and provides a valuable and steadily expanding collection of photographs. Measuring and calculating machines are available for the measurement and reduction of the photographs. The principal program of the Observatory is an accurate study of the distances, motions and masses of the nearer stellar systems.

The Sproul Observatory is open to visitors on the second Tuesday night of each month during the college year—October through May. With clear weather, visitors have the opportunity of seeing many celestial objects of various types in the course of a year. The visiting hours are from 7:00 to 8:30 p.m. in the fall and winter, but are set later during the spring.

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REQUIREMENTS AND RECOMMENDATIONS

Prerequisites for an Astronomy major, in course, are Astronomy 1-2, 1-12, 11-2, or 11, 12, advanced courses and seminars (taken as double courses) in Astronomy, combined with work in mathematics and physics.

Prerequisites for admission to the Honors program in Astronomy, either as a major or a minor, are mathematics 11, 12, Astronomy 1-2, 1-12, or 11, 12, Physics 1-2, and a reading knowledge of French, German or Russian.

1-2. Descriptive Astronomy. These courses provide an introduction to the methods and results of astronomy. Fundamental notions of physics are studied as they are needed to provide an adequate scientific basis for the course. Three class periods each week, practical work to be arranged.

Year course. Staff.

11. Intermediate Astronomy (Astromechanics; Descriptive). Celestial sphere, celestial navigation. Motions of stars, planets and satellites. Kepler's laws. Newton's law of gravitation.

The two-body problem, introduction to the three-body problem and perturbations. Orbits.

Survey of solar system. Atoms and radiation. Architecture, composition and radiation of the sun.

Prerequisites: Mathematics 3,4 or equivalent; Physics 1,2, or equivalent, may be taken concurrently with consent of instructor.

Fall semester. Mr. Heintz.

12. Intermediate Astronomy (Astrophysics; Galactic Structure). Observational data; spectrum-luminosity relation. Double stars; mass-luminosity relation. Unstable stars. Stellar clusters. Interstellar material. Galaxies.

Structure of Milky Way system. Expanding universe; origin, age and evolution of stars and galaxies.

Prerequisites: Mathematics 3,4, or equivalent; Physics 1,2, or equivalent, may be taken concurrently with consent of instructor.

Spring semester. Mr. Heintz and Mr. van de Kamp.

53. Double Stars. Visual, spectroscopic, and photometric binaries. Their observation and orbit computation.

Fall semester. Mr. Heintz.

54. Mathematical Tools of Astronomy. Spherical triangles and apparent stellar places. Basic theory of errors and correlations. Equations of motion, perturbations and numerical integration. Theory of radiation and model atmospheres.

Spring semester. Mr. Heintz.

HONORS SEMINARS

101. Astrometry. Spherical trigonometry, celestial sphere. Stellar positions and their changes. Precession, proper motion, parallax and aberration. Solar motion, galactic rotation. Relation between sphere and plane. Long-focus photographic astrometry, technique and methods. Analysis of stellar paths for proper motion and parallax; secular acceleration. Visual binaries; analysis for

ASTRONOMY

mass-ratio; perturbations. Star fields; clusters and multiple stars. Theory of errors, methods of least squares.

Spring semester. Mr. van de Kamp.

104. Astrophysics. Review of observational material. Atomic spectra. The gaseous state. Radiation. Continuous spectra of stars. Formation of absorption lines. Stellar interiors.

Fall semester. Mr. Hershey.

110. Research Project.

Staff.

GRADUATE WORK

In conformity with the general regulations for work leading to the Master's degree (see page 74), this department offers the possibility for graduate work.

Candidates for the Master's degree will normally take four Honors seminars, selected from those listed in astronomy, mathematics or physics, in consultation with the faculty member under whose direction the work is to be done. A thesis may be substituted for one of the seminars.

Candidates for the Master's degree must have a good reading knowledge of two modern languages.

The opportunity exists for pursuing advanced work at the Bartol Research Foundation, which conducts doctoral programs in astronomy and physics. (See p. 12).

BIOLOGY

LAUNCE J. FLEMISTER, *Professor*

LUZERNE G. LIVINGSTON, *Professor*

NORMAN A. MEINKOTH, *Professor and Chairman*

NEAL A. WEBER, *Professor*

KENNETH S. RAWSON, *Associate Professor*‡

ROBERT E. SAVAGE, *Associate Professor*

SANDRA J. GILL, *Assistant Professor*

JAMES C. HICKMAN, *Assistant Professor*

JOHN B. JENKINS, JR., *Assistant Professor*†

BARBARA Y. STEWART, *Assistant*

JEAN D. TOMEZSKO, *Assistant*

The student may be introduced to the study of biology by taking Biology 1 and Biology 2. Either course may be taken first. Together they offer an overview of the field of biology. A broad diversity of advanced courses, some offered on alternate years, affords the student the opportunity of building a broad biological background while concentrating, if he chooses, in some specialized area such as plant biology (botany), animal biology (zoology), cellular and developmental biology, physiology, genetics and evolution, ecology or systematics.

‡Absent on leave, 1971-72.

†Absent on leave, spring semester, 1971-72.

BIOLOGY

REQUIREMENTS AND RECOMMENDATIONS

Students electing a Course major in biology should include the following supporting subjects in addition to the minimum of eight courses comprising 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 (Physics 1,2) 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.

HONORS WORK

Requirements for admission to Honors with a major in biology include: Biology 1 and 2, an advanced course in biology, plus courses in chemistry and mathematics as cited above, with physics strongly recommended. It should be noted that certain subjects likely to be chosen as minors in other departments require a second year of mathematics.

Students planning an Honors minor in biology should note the prerequisites listed for each Honors offering, and consult with the department chairman.

1. Principles of Biology. An introduction to the study of phenomena fundamental to living systems. The emphasis will be at the cellular level and will include the consideration of cell structure and function, genetics, cell differentiation, organic evolution, and ecology.

Three lectures and one three-hour laboratory per week.

Fall semester. Staff.

2. Organismal Biology. An introduction to the study of whole organisms, chiefly the higher plants and animals. While basic taxonomy will be included stress will be placed on adaptive aspects of the morphology and physiology of organisms, their development, behavior, ecology and evolution.

Three lectures and one three-hour laboratory per week.

Spring semester. Staff.

12. Vertebrate Physiology. A general consideration of the functional process in animals with emphasis placed on mammals and other vertebrates. The aspects of adaptation of the animal to environmental stress are treated in such a way as to serve the individual student's area of concentration. Two lectures and one conference per week. This course will not count toward a major in biology.

Spring semester. Mr. Flemister.

14. Vertebrate Morphology. A consideration of the vertebrate body plan at the microscopic, developmental and adult gross morphological levels. Areas stressed in some detail will include the structure and microscopic appearance of vertebrate tissues and organs, embryonic development of an amphibian through organogenesis and adult mammalian gross morphology.

Three hours of lecture or discussion and one laboratory period per week.

Prerequisite: Biology 2.

Fall semester. Mr. Meinkoth.

15. Taxonomy of Seed Plants. An introduction to the classification of flowering plants and gymnosperms and its underlying theory and methods. Emphasis is upon biologically, culturally, and economically important aspects of the world flora, with special reference to native spring plants. Recent advances in bio-systematics, plant speciation, biochemical and numerical taxonomy, phylogeny, and biogeography are included. Suggested as an early course

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for biology majors and as a cultural course for non-majors. Three lectures and one field trip and/or laboratory per week.

Prerequisite: Biology 2 or consent of instructor.

Spring semester. Mr. Hickman.

16. Developmental Plant Anatomy. The fundamentals of anatomy of seed plants approached from a developmental standpoint. The structure and behavior of meristems, problems and processes of differentiation, and a detailed analysis of cellular, tissue and organ structure in higher plants.

Three lectures and one three-hour laboratory period per week.

Prerequisite: Biology 1,2.

Alternate years, fall semester. Not offered in 1971-1972. Mr. Livingston.

18. Biology of Lower Plants. An introduction to the algae, fungi, mosses, and ferns, including aspects of their classification, phylogeny, structure, physiology, and ecology. The laboratories are in part exploratory and experimental. Their content depends in part upon the current interests of staff and students.

Three lectures and one field trip and/or laboratory period per week.

Prerequisite: Biology 1,2.

Alternate years, fall semester. Mr. Livingston.

20. Biology of the Gene. The course will deal with three basic areas: The discovery, structure, and replication of the genetic material; the transmission of the genetic material; and the mode of action of the genetic material, including a consideration of development genetics. Some time will be devoted to the historical development of genetic concepts. Areas of genetics not covered in this course (i.e., population genetics, quantitative inheritance, etc.) will be treated in Biology 22.

Three lectures per week and a laboratory or library project.

Prerequisites: Biology 1 and 2, or consent of the instructor.

Recommended: Organic chemistry.

Fall semester. Mr. Jenkins.

21. Cell Biology. A study of the ultrastructure and function of cell components, including cell division and development, biosynthesis of macromolecules, and intermediary metabolism. Laboratory exercises are designed to illustrate the variety of approaches to findings in cell biology.

Prerequisites: Biology 1, and concurrent registration in organic chemistry.

Spring semester. Mr. Savage.

22. Organic Evolution. An introduction to the history of evolutionary thought; an analysis of genetic mechanisms as they apply to the problem of speciation, and a consideration of selected evolutionary pathways and the evidence which supports them.

Two lectures and one discussion session per week.

Prerequisites: Biology 1 and 2.

Spring semester. Not offered in 1971-1972. Mr. Jenkins.

25. Field Zoology. Emphasis is on the living animals as they occur in nature, their systematics, relationships to the environment, habits and distribution. Regional and world faunas will be discussed. Much of the work will be done in the field.

Prerequisites: Biology 2, Biology 14 desirable.

Spring semester. Mr. Weber.

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30. Topics in Genetic Research. A laboratory course designed to acquaint the student with some of the more sophisticated techniques and approaches to modern genetic analysis. The emphasis will be on various types of viruses, bacteria and drosophila.

One afternoon per week of literature discussion and research.

Prerequisites: Biology 20 and consent of instructor. Enrollment limited.

Fall semester. Mr. Jenkins.

40. Man and Environment. Consideration is given to the methodology of ecological analysis and its application to the study of the causes and consequences of the growth of technology and human populations, especially in relation to the question of environmental deterioration. An attempt is made to synthesize approaches and information from various disciplines within the social and natural sciences. (Also listed as Sociology-Anthropology 40.)

Prerequisites: Completion of distribution requirements in Groups 1 (Natural Sciences and Engineering) and 4 (Social Sciences).

Spring semester. Mr. Hickman and Mr. Mitchell.

52. Developmental Biology. A study of animal morphogenesis, with emphasis on vertebrate development. Lectures will consider the relationship of the embryo to its environment, the storage, partitioning, and expression of information during early development, the process of specializations and interactions of cells to form organs and tissues, and selected topics of postembryonic development. The laboratory will be devoted to the developmental anatomy of selected vertebrates, and the observation of living vertebrate and invertebrate material under normal and experimental conditions.

Three lectures and one laboratory per week.

Prerequisites: Biology 1,2,14. Chemistry 28 recommended.

Spring semester. Ms. Gill.

53. The Social Insects. A study of the social insects, their evolution of the social habit, colonies, populations, ecological relationships, behavior and methods of communication. A laboratory created for living tropical fungus-growing ant colonies will be used.

Fall semester, Mr. Weber.

54. Biology of Parasitism. A consideration of parasitology with reference to evolution and adaptation to the parasitic habit. Surveys are made of parasites in native animals. Classification, life cycles and epidemiology are reviewed.

Alternate years, spring semester. Not offered in 1971-1972. Mr. Meinkoth.

56. Invertebrate Zoology. A course designed to acquaint the student with the fundamental morphology, classification, phylogeny and special problems of the invertebrate phyla.

Three lectures and one laboratory period per week. Occasional field trips.

Spring semester. Mr. Meinkoth.

57. Comparative Physiology. A course of lectures and laboratory experiments treating functional processes from the standpoint of adaptation of the animal to its environment. These processes in representative animals are compared in order to follow their elaboration from the more general to the more specialized.

Two lectures and one laboratory period per week.

Prerequisites: Biology 14, organic chemistry and physics.

Fall semester. Mr. Flemister.

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58. Physiological Ecology. A course of lectures, discussions and experiments concerning the physiological adaptations of representative animals to environmental stress. Requirements and availability of optimum conditions of temperature, oxygen, food-stuffs and the maintenance of ionic independence are appraised.

Two lectures and two laboratory periods per week.

Prerequisite: Biology 57.

Spring semester. Mr. Flemister.

59. Cytology. A consideration of the nucleus in regard to its structure and activities and to its interaction with cytoplasm, including investigations of nuclear ultrastructure, replication of chromosomal constituents, cell division, biosynthesis of nucleic acids and proteins, the role of the nucleus and chromosomes in cell development. Laboratory experiments are designed to illustrate the variety of approaches to findings in cytology.

Three lectures and one laboratory per week.

Prerequisites: Biology 1 and organic chemistry.

Fall semester. Not offered in 1971-1972. Mr. Savage.

60. Biology of Animal Communities. The study of animals at the emergent level of populations. Problems of animal behavior as related to the growth and maintenance of populations will be considered with particular reference to communication and social interaction within animal groups. Both field and laboratory study techniques will be used.

Two lectures per week and the equivalent of one laboratory meeting per week.

Prerequisite: Biology 2.

Fall semester. Not offered in 1971-1972. Mr. Rawson.

65. 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 courses.

Fall or spring semester. Staff.

67. Plant Physiology. An integrated study of the physiological processes of higher plants, including general cellular physiology, water relations, mineral nutrition, enzyme action, photosynthesis, metabolic processes, translocation, the physiology of growth and development, and related topics.

Two lectures, one discussion period, and one laboratory period per week.

Prerequisites: Biology 1,2 and organic chemistry.

Alternate years, spring semester. Mr. Livingston.

68. Biology of Bacteria. An approach to the study of bacteriology with principal emphasis on the consideration of bacteria as organisms rather than as causative agents of disease, etc. The morphology, physiology and biochemistry, ecology, genetics, and classification of bacteria.

Three lectures and one laboratory period per week.

Prerequisites: Biology 1 and organic chemistry.

Spring semester. Not offered in 1971-1972. Mr. Livingston.

70. Plant Ecology. A study of the response of plant individuals and communities to environmental factors and the influence of plants upon their own environments and those of selected other organisms. The physical nature of the ecosystem is developed, with reference to the role of plants in energy flow, material cycles, and soil formation. Divergent concepts of niche, community,

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and biotic diversity are discussed, as are world patterns of vegetation and productivity. Laboratory work emphasizes the collection, analysis, and interpretation of field data.

Three lectures and one field trip or laboratory period per week.

Prerequisites: Biology 2 and permission of the instructor.

Recommended: Biology 15.

Fall semester. Mr. Hickman.

71,72. Special Topics. With the permission of the department, qualified students may elect to pursue a research program not included in the regular Course program.

Staff.

HONORS SEMINARS

102. Cytology. A study of the structure and function of the cell. Living material will be examined and modern microscopical techniques employed in the laboratory.

Spring semester. Mr. Savage.

103. Analysis of Development. Discussions will be devoted to the nature of the developmental process, and analyses of selected problems of differentiation and morphogenesis. Laboratories will include a survey of vertebrate developmental anatomy, an introduction to experimental analysis of developing systems, and individual student projects.

Prerequisites: Biology 1,2; 14 or 16. Biology 20 and Chemistry 28 recommended.

Fall semester. Ms. Gill.

104. Comparative Physiology. An intensive consideration of the physical and chemical phenomena underlying the function of animals. A comparative approach is maintained in order to consider the progression from more general to the most specialized adjustments, acclimatizations and adaptations of animals to physical, chemical and biological stresses in the environment. The terminal portion of the laboratory program is devoted to the pursuit of original, independent work by the student.

Prerequisites: Biology 14, organic chemistry and physics.

Fall semester. Mr. Flemister.

106. The Social Insects. Seminar treatment of course 53. Selected topics in the evolution, ecological relationships, behavior and methods of communication in social insects. Current research will be considered and an opportunity to study living colonies of ants will be afforded.

Fall semester. Mr. Weber.

107. Invertebrate Zoology. A study of the morphology, taxonomy, natural history, distribution and adaptation of invertebrate phyla with a special emphasis on evolutionary trends, ecological relations, and problems peculiar to each group.

Alternate years, fall semester. Not offered in 1971-1972. Mr. Meinkoth.

108. Physiological Basis for Animal Behavior. Quantitative description and analysis of animal behavior and the sensory processes used in communication and orientation. Field and laboratory experience will illustrate the seminar topics. Specific problems will serve as a basis for subsequent seminar discus-

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sions. Consequently, in addition to the seminar meetings, a commitment is expected to a full day of laboratory or field investigation per week, free of conflicting academic course commitments.

Fall semester. Not offered in 1971-1972. Mr. Rawson.

111. Plant Physiology. An extension of the area covered in course 67, with particular emphasis on a critical study of original sources, both classical and current. The seminar discussion is accompanied by a full day of laboratory work each week.

Prerequisites: Biology 1,2 and organic chemistry.

Alternate years, spring semester. Mr. Livingston.

112. Problems of Plant Growth and Development. A correlated anatomical and physiological approach to developmental plant anatomy and morphogenesis. The seminar discussion is accompanied by a full day of laboratory work each week.

Prerequisites: Biology 1,2 and permission of the instructor.

Alternate years, fall semester. Not offered in 1971-1972. Mr. Livingston.

113. Genetics. An extension of the area covered in course 20, with particular emphasis on current research in the field of inheritance in all its aspects. The seminar discussion is accompanied by a full day of laboratory work each week.

Spring semester. Not offered in 1971-1972. Mr. Jenkins.

118. Plant Ecology. A study of the interrelationships between plants and their environment. Discussion periods are devoted to the development of basic principles. Field and laboratory work applies these concepts to specific organisms and habitats. Laboratory work is used to isolate problems encountered in the field. Both higher plants and microorganisms are used as experimental materials. Comparisons are made between aquatic and terrestrial habitats.

Prerequisites: Biology 1,2 and permission of the instructor.

Alternate years, fall semester. Mr. Hickman.

120. Special Topics. With the permission of the department, qualified students may elect to pursue a research problem not included in the regular offerings in Honors.

Staff.

BLACK STUDIES

CLEMENT COTTINGHAM, JR., *Director*

The purpose of the Black Studies program at Swarthmore College is (1) to enrich the general education of Swarthmore students; (2) to expose all interested students to the multiple contributions and culture of black Americans; and (3) to inform students participating in the program about the specific social, political, and economic conditions, past and present, affecting the development of black communities, particularly in the United States, but also in the Caribbean and in Africa.

The program first offered a limited number of courses in 1969-70. In 1970-71, the program expanded its offerings with additional courses in Political Science, History, Economics and Religion. It is hoped to expand course offer-

BLACK STUDIES

ings in 1971-72 with additions in Music, English, and Sociology-Anthropology. By taking at least five semester courses in Black Studies students may graduate with a concentration in this field in addition to their regular major. The formal course program will be supplemented from time to time through special colloquia, guest speakers or other presentations of special interest to students interested in Black Studies.

Economics 26. Social Economics. The extent, consequences, and causes of poverty and economic insecurity; an appraisal of reforms in social insurance, medical care, public housing, and rural development; the economics of discrimination and urban ghettos.

Fall semester. Not offered in 1971-1972.

Economics 75. The Black Worker in American Society. This course will trace the economic status of black workers in this country from the period of slavery to the present. The relative income position and career patterns of black workers will be examined in terms of geographical, industrial and occupational changes, and in terms of the economic, political and institutional influences which have brought about these changes. Relevant policies of union, management and government will also be reviewed. One major feature of the course will be independent investigation and research of contemporary employment problems of black workers.

Spring semester.

Education 17. Problems in Urban Education. This course considers the problems of schools in big cities, related to topics such as financial support, community relations, professional staff, curricular innovation, pupil personnel. A weekly seminar, individual study, and field investigation in the city of Philadelphia.

Fall semester. Mrs. Brodhead.

English Literature 29. Black Literature. A survey of Afro-American literature from 1750 to the present. Emphasis will be placed on the modern period, with special consideration given to the "political" dimension of Afro-American writing as a problem in criticism.

Fall semester. Mr. Mayers.

History 8: Africa. African history and civilization, with an emphasis on tropical Africa in modern times.

Fall semester. Mr. Wright.

History 40. Introduction to Afro-American History. An interdisciplinary survey of the black experience in the United States from 1619 to the present. The major thrust of the course will be to examine black views on politics, science, education, and philosophy, as well as black perspectives on race relations.

Fall semester. Mrs. Morgan.

History 41. Topics in Afro-American History. A course of limited enrollment devoted to an investigation into the sources, problems, and methods involved in the study of black history, with special emphasis on folk history.

Spring semester. Mrs. Morgan.

History 42. Topics in African History. Special problems in African history. Offered as opportunity permits. Limited enrollment. The topic in 1971-72 will be South Africa, with an emphasis on White-Black relations.

Spring semester. Mr. Wright.

BLACK STUDIES

Political Science 10. Urban Sociology and Politics

11. Problems in Urban Housing

12. Problems in Urban Education

(See Department of Political Science for descriptions of these courses.)

Political Science 11. Problems in Community Government. This course will explore problems of urban political change in Black urban communities as a problem in community government. The course will focus upon (i) the contemporary social and cultural setting of local politics, (ii) the changing structure of black leadership, the flowering of competing ideological tendencies and political strategies, (iii) Black urban communities, and (iv) the effects of deteriorating financial resources upon urban government. A major section of the course will be devoted to research on urban political problems. Not offered in 1971-1972. Mr. Cottingham.

Political Science 21. Politics of Africa. The analysis of political processes in a variety of African states, including a brief examination of traditional systems, the colonial system and the rise of independence movements, and an analysis of contemporary political patterns.

Spring semester. Mr. Hopkins.

Psychology 45. Group Dynamics. The course will deal with the psychological aspects of behavior in groups. Issues such as intimacy, solidarity, group problem solving, leadership development, splinter-group formation, and phases of group development will all receive attention. Classroom sessions will focus on the ongoing behavior within the group itself. Outside reading and papers will be used to illuminate processes within the group and to raise significant theoretical problems. (By application only)

Fall semester. Mr. Gergen.

Psychology 48. Intergroup Relations. An examination of factors that create strife and conflict among persons, and conditions enhancing interpersonal tolerance and acceptance. Particular attention will be given to minority groups, race relations, and communication between individuals of diverse backgrounds.

Fall semester. Not offered 1971-1972. Mr. Peabody.

Religion 15. The Contemporary Black Church in Historical Perspective. An analysis of the present day Black Church and its relationship to the historical struggle for liberation of the Black community. This course will examine the development of the Black Church as it parallels the slave era, reconstruction, Black Nationalist Movement of the 1920s, Black northern migratory patterns, and contemporary Black social, political and theological movements. *Half course.*

Spring semester. Mr. Bryant.

Sociology 51. Caribbean Society. A review of the attempt to develop generalizations about the structure of Caribbean society. Theoretical materials will focus on the historical role of slavery, the nature of plural societies, race, class, ethnicity, and specific institutions, such as the family, the school, the church, and the political structure.

Not offered in 1971-1972. Mr. Branson.

CHEMISTRY

EDWARD A. FEHNEL, *Professor*

JAMES H. HAMMONS, *Associate Professor*

PETER T. THOMPSON, *Associate Professor and
Acting Chairman*

TERESA B. FREEDMAN, *Assistant Professor*

JAMES R. HUTCHISON, *Assistant Professor*

The aim of the department of chemistry is to provide a sound training in the fundamental principles and basic techniques of the science rather than to deal with specialized branches of the subject.

The minimum requirement for a major in chemistry is eight courses in the department. Majors are strongly advised to include in their programs Chemistry 28,29 and 101 (or 51,59), as well as second year of mathematics.

Students are advised that sound preparation for professional work in chemistry includes: Chemistry 1,2 (or 11,12); 28,29; 101 (or 51,59); and at least four additional semesters of chemistry; Physics 1,2 and two years of mathematics; proficiency in reading scientific German, Russian or French (preferably German).

Majors who wish to meet the minimum standards for professional training of chemists set by the American Chemical Society should consult with their advisers as to what additional work is required.

To accommodate varying backgrounds in the preparation of incoming students the department provides three routes for entrance to its advanced level program. The normal route is to take Chemistry 1,2, followed by 28,29. Students with especially strong pre-college background in mathematics may be advised to take Chemistry 11,12 followed by 28,29. Still others with especially strong pre-college chemistry preparation may be advised to begin with Chemistry 28,29 followed by 11,12.

Students who enter college with advanced training in chemistry are encouraged to take a placement examination during freshman orientation week to determine which college chemistry course they should take.

1,2. Introduction to Chemistry. A study of the central concepts and basic principles of chemistry; the interpretation of chemical properties and reactions through equilibrium constants, oxidation potentials, free energies, thermochemistry; the relation of chemical properties to atomic and molecular structure and to the Periodic Table; rates and mechanisms of chemical reactions.

One laboratory period weekly.

Fall and spring semester. Mr. Hutchison.

11, 12. General Chemistry. The subject matter of this course parallels that of Chemistry 1,2 but at a more advanced and mathematically oriented level. The course is intended for students with a strong interest in chemistry, whose high school preparation has been extensive, especially in mathematics.

Admission to this course is based on consultation with the staff and a placement examination. Prior or concurrent enrollment in Physics 1,2 is highly desirable. One laboratory period weekly.

Fall and spring semester. Mr. Thompson and Mrs. Freedman.

CHEMISTRY

28, 29. Organic Chemistry An introduction to the chemistry of the more important classes of organic compounds, with emphasis on nomenclature, structure, reactions, and methods of synthesis. Current theoretical concepts of structure and mechanism are applied throughout the course to the interpretation of the properties and reactions of a wide variety of organic compounds. The laboratory work illustrates some of the principles and reactions discussed in the classroom and provides practical experience in the techniques involved in synthesizing, isolating, purifying, and characterizing organic compounds.

One laboratory period weekly.

Prerequisite: Chemistry 2 or 12 or permission of the instructor.

Fall and spring semester. Mr. Hammons.

51. Introductory Physical Chemistry. The macroscopic principles of physical chemistry are introduced with emphasis on thermodynamic principles; states of matter, chemical equilibria, solutions, electrochemistry, electro-analytical techniques. The use of digital computers in solving chemical problems is introduced. This course is suitable for biology or pre-medical students wishing a one semester introduction to physical chemistry.

Prerequisites: Chemistry 2 or 12, a year of college level mathematics including differential and integral calculus, Physics 1,2.

One laboratory period weekly.

Fall semester.

56. 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.

Prerequisite: Chemistry 28,29.

One laboratory period weekly.

Fall semester. Mr. Fehnel.

57. Analytical Chemistry. Many of the principles and techniques of analytical chemistry are taught within the context of other courses listed in this section of the catalogue. Course 57 is intended to provide further, and more advanced, experience with the theories, techniques and instruments used in analysis.

Prerequisite: Introductory Physical Chemistry 51.

Not offered in 1971-1972.

58. Biological Chemistry. An introduction to the chemistry of living systems, with emphasis on the relationship of molecular structure and chemical reactivity to biological function. Consideration will be given to such topics as the organic chemistry of cellular constituents, certain aspects of intermediary metabolism and biosynthesis, mechanisms of enzyme action, and the chemical basis of genetics.

Prerequisite: Chemistry 1, 2 or 11, 12 and 28, 29.

Fall semester. Mr. Fehnel.

59. Chemical Dynamics and Structure. A continuation of the physical chemical principles begun in Course 51 with emphasis on microscopic and time-dependent properties; kinetic theory of gases, statistical mechanics, chemical kinetics, elementary quantum chemistry, spectroscopic methods of molecular structure determination, X-ray crystallography.

Prerequisite: Chemistry 51. Physics and Engineering students may enter 59 without taking 51 provided they have met the prerequisites for 51.

One laboratory period weekly.

Spring semester.

CHEMISTRY

63. Quantum Chemistry. Quantum theory is developed and applied throughout to a variety of topics including: atomic structure, molecular and atomic spectroscopy, theories of chemical bonding, and molecular structure determination. Symmetry and group theoretical arguments are developed and applied extensively.

Prerequisite: Chemistry 59 and a second year of mathematics including some linear algebra. Senior physics and engineering students may take Chemistry 63 without 59 provided they have met the prerequisites for 59.

Fall semester.

65. Advanced Inorganic Chemistry. Important principles for the understanding of the chemical behavior of inorganic compounds are discussed. Topics include: electronic structure of atoms, ionic and covalent bonding, molecular orbital theory applied to inorganic compounds, and inorganic reaction mechanisms. Considerable emphasis is placed on the chemistry of transition metal coordination compounds through the application of ligand field theory.

Prerequisite: Chemistry 59. Chemistry 63 is highly desirable.

67. Physical Organic Chemistry. Selected topics in organic chemistry, including resonance and molecular orbital concepts, physical properties of organic compounds, stereochemistry, mechanisms of ionic reactions, free radicals, electrocyclic reactions, photochemistry, and other topics of current interest. A familiarity with physical chemistry is desirable.

Prerequisite: Chemistry 1, 2 or 11,12 and 28, 29.

Spring semester. Mr. Fehnel.

68. Advanced Laboratory. Individual projects of the investigative or research type in which the student has primary responsibility for the design of the experiment and the solution of the problem. Normally two or three projects in different areas will be assigned in each semester. This laboratory work is intended to give the student practical experience in the solution of a research problem, to develop facility in the use of the chemical literature and in the interpretation and communication of experimental results, and to stimulate interest in current developments in chemical research.

A prerequisite to this course is normally the completion of seven semester courses in chemistry.

Both semesters. Staff.

69. Special Topics. The course provides an opportunity for qualified advanced students to undertake original investigations or to make detailed literature studies of selected topics in the fields of inorganic, organic, analytical, or physical chemistry. Students who propose to take this course should consult with the appropriate instructor during the early part of the semester preceding that in which the work is to be done.

Approximately ten hours of laboratory and/or library work weekly.

Fall and spring semester. Staff.

HONORS SEMINARS

Before admission to Honors work the chemistry major should complete Chemistry 1,2 or 11,12 and 28,29, two years of mathematics including a year of differential and integral calculus, and Physics 1,2. An Honors program in chemistry should include Chemistry 56 and 57.

101. Physical Chemistry. The gaseous, liquid, and solid states, solutions, elementary thermodynamics, chemical equilibria, electrochemistry, the kinetics

CHEMISTRY

of chemical reactions, elementary quantum theory and statistical mechanics.

Prerequisites: Second year mathematics and general physics.

One seminar and laboratory weekly.

Spring semester. Mr. Thompson.

106. Physical Organic Chemistry. An intensive study of essentially the same material covered in course 67. A familiarity with physical chemistry is desirable.

Prerequisites: Chemistry 1,2 or 11,12 and 28,29.

108. Valence and Molecular Structure. Quantum theory is developed and applied throughout to a variety of topics including: atomic structure, molecular and atomic spectroscopy, theories of chemical bonding, and molecular structure determination. Symmetry and group theoretical arguments are developed and applied extensively.

Prerequisite: Chemistry 101.

Fall semester. Mr. Thompson.

109. Thesis. Honors candidates may write a thesis as preparation for one of their papers. 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.

CLASSICS

HELEN F. NORTH, *Professor and Chairman*‡

MARTIN OSTWALD, *Professor and Acting Chairman*

JULIA HAIG GAISSER, *Assistant Professor*

THOMAS N. MITCHELL, *Assistant Professor*‡

ALDEN A. MOSSHAMMER, *Assistant Professor*

GILBERT P. ROSE, *Assistant Professor*

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 31 onwards presuppose no knowledge of the Greek or Latin languages and are open (except for 42 and 44) 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.

‡Absent on leave, 1971-72.

CLASSICS

REQUIREMENTS AND RECOMMENDATIONS

Greek, Latin, or Ancient History may be offered as a major subject either in Course or in Honors, and as a minor subject in Honors.

A major in Greek or Latin in Honors or in Course should complete during the first two years either Intermediate Greek or Intermediate Latin.

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

Minor students in Honors should complete during the first two years either Intermediate Greek or Intermediate Latin.

Majors in both Honors and Course are strongly advised 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 but one of these will be prepared for by seminars. Either Directed Reading in a field in which a seminar is not given (courses 17,18), 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 following: Greek 113, Latin 102. The prerequisites for Classics 42 and 44 are Classics 31 and 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 consist of (1) and (2) above, with the specified prerequisites.

Majors in Latin in Course or Honors are eligible for certification as secondary school teachers in Pennsylvania, provided that they include in their programs a course in Roman history and either Classics 35 or Classics 36.

Greek

1-2. Elementary Greek. The essentials of Greek grammar are covered and selections from masterpieces of Greek literature are read.

Year course. Mr. Ostwald.

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, each semester. Staff.

11, 12. Intermediate Greek. Plato's *Apology*, a play of Euripides, and selections from Homer are read.

Mr. Rose.

13, 14. Greek Prose Authors. The works read are determined by the interests and needs of the members of the class. These readings are supplemented by a survey of the history of Greek Literature. Credit is given for each semester.

Miss North.

15, 16. Greek Poets. The works read are determined by the interests and needs of the members of the class. Credit is given for each semester. The course is offered only when required.

Mrs. Gaisser.

CLASSICS

17, 18. 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 departmental chairman.

Staff.

19. Comparative Grammar of Greek and Latin. A study of the morphology, phonology, and inflection of Greek and Latin words derived from Indo-European. Students are expected to have the equivalent of at least two college years of one language and one college year of the other. No prior experience in linguistics is assumed.

Fall semester. Not offered in 1971-72. Mr. Rose.

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

Staff.

Latin

1-2. Elementary 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.

Study of the language is combined with a weekly meeting in which students are introduced to a wide range of topics related to the study of Latin. These include such subjects as Roman art, archaeology, palaeography, religion, and (in translation) masterpieces of Latin literature. These meetings will normally be conducted by specialists from the Swarthmore faculty and from neighboring colleges.

The course will have four one-hour meetings each week, for the study of the language, and one two-hour meeting each week for lecture and discussion. It carries one and one-half course credits each semester.

Year course. Mr. Rose.

3. Intermediate Latin: Catullus. A study of the lyric, elegiac, and hexameter poetry of Catullus. This course follows Latin 2 and is open to those with two or three years of high school Latin.

Fall semester. Mrs. Gaisser.

4. 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. Mrs. Gaisser.

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 3 and Latin 4. The course meets one hour a week.

Half course, each semester. Staff.

11. Introduction to Latin Literature. A study of Roman Comedy. This course is normally open to students who have had four or more years of high school Latin. Students admitted with fewer than four years of Latin are required to take Latin 9 in conjunction with this course.

Fall semester. Mr. Mosshammer.

CLASSICS

12. Horace. A study of the *Odes* of Horace. This course is normally open to students who have had four or more years of high school Latin. Students admitted with less than four years of high school Latin are required to take Latin 10 in conjunction with this course.

Spring semester. Staff.

13. 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.

Fall semester. Mrs. Gaisser.

17, 18. 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 departmental chairman.

Staff.

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

Staff.

Ancient History and Civilization

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. This is preceded by a brief survey of the Oriental civilizations by which the Greeks were influenced. 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 towards a major in History.

Fall semester. Mr. Mosshammer.

32. The Roman Republic. A study of the Roman world in the period 300-44 B.C. Four major subjects will be dealt with in detail: (1) The evolution of the Republican constitution, (2) Rome's wars of expansion and the acquisition of her empire, (3) The Roman Revolution, and (4) The cultural background.

Students will be required to read the pertinent original sources in translation, as well as a selection of modern viewpoints. Students' reports and discussion will accompany the lectures. There is no prerequisite. Classics 32 meets the distribution requirement for Group 3; it counts towards a major in History.

Spring semester. Mr. Mosshammer.

33. Greek Literature in Translation. In 1971-72 this course will focus on Ancient Epic Poetry. Reading will include Homer's *Iliad* and *Odyssey*, Virgil's *Aeneid*, and Ovid's *Metamorphoses*. The primary goal will be to analyze each poem on its own merits, but in addition some attention will be given to the development of the epic genre and to the links between Homeric and Augustan poetry (for example, Apollonius, Lucretius, Catullus). Differences between oral and written epic poetry will be studied.

Fall semester. Mr. Rose.

34. Colloquium on the Ancient Theatre. All extant examples of Greek and Roman drama (both tragedy and comedy) will be read in translation, and there will be a study of ancient dramatic production and the physical remains of Greek and Roman theatres. There is no prerequisite, but preference will be given to students who have had some previous acquaintance with dramatic literature, or have taken Classics 33 or 35.

Spring semester. Mr. Oswald.

CLASSICS

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.

The course is given in alternate years.

Fall semester. Not offered in 1971-72. Miss North.

36. Classical Mythology in Literature and Art. The course is designed to give familiarity with those myths and legends that have served as material for writers and artists from ancient times to the present. The principal works studied are Homer's *Odyssey*, Hesiod's *Theogony*, selected Greek tragedies, Virgil's *Aeneid*, the *Metamorphoses* of Ovid, and Dante's *Commedia*. A study is made of the way in which mythological themes have been handled in painting and sculpture at various periods, and topics for papers provide an opportunity for the study of the treatment of mythology by writers from the Renaissance to modern times.

The course is normally given in alternate years.

Spring semester. Not offered in 1971-72. Miss 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 towards a major in History.

The course is normally given in alternate years.

Prerequisite: Classics 31 or its equivalent.

Fall semester. Mr. Mosshammer.

44. The Roman Empire. This course treats in detail the political, economic, social, and cultural history of the Roman world from the death of Julius Caesar to the death of Marcus Aurelius in A.D. 180. Special attention is given to Octavian's rise to power, the transformation of the republican constitution into an autocracy, and the impact of this change on the administration of the empire, on the structure of Roman society, and on literary and artistic movements. Classics 44 counts towards a major in History.

The course is normally given in alternate years.

Prerequisite: Classics 32 or its equivalent.

Spring semester. Mr. Mosshammer.

HONORS SEMINARS

102. Roman Historians. This seminar combines a survey of Latin historical writing to the end of the Silver Age with intensive study of selected books of Livy and Tacitus, both as examples of Roman historiography and as sources for Roman history.

Spring semester. Mr. Mitchell.

103. Latin Epic. This seminar traces the development of Roman epic poetry, with particular emphasis on the *De Rerum Natura* of Lucretius and the *Aeneid* of Virgil. Some attention is also given to early Roman epic, as represented by the *Annales* of Ennius, and to the later epic, typified by Lucan's *Pharsalia*.

Spring semester. Staff.

CLASSICS

104. Roman Satire. A study of the *Satires* and *Epistles* of Horace and of the *Satires* of Juvenal is supplemented by a general survey of the development of Roman satire.

Fall semester. Mr. Mitchell.

105. Cicero. A study of the political and forensic speeches of Cicero and of his personal correspondence as sources for the political and constitutional history of the final years of the Roman Republic. Attention is also paid to Ciceronian prose style as exemplified in his letters and orations.

Fall semester. Mr. Mitchell.

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. Mr. Ostwald.

112. Greek Epic. The study of Homer's *Iliad* or *Odyssey* constitutes the chief work of this seminar. Some attention is also paid to Hesiod's *Theogony* and to the *Argonautica* of Apollonius of Rhodes.

Spring semester. Miss North.

113. Greek Historians. This seminar is devoted to a study of Herodotus and Thucydides, both as examples of Greek historiography and as sources of Greek history.

Fall semester. Mr. 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. Mr. Rose.

ECONOMICS

EDWARD K. CRATSLEY, *Professor*

FRANK C. PIERSON, *Professor and Chairman*

ROBINSON J. HOLLISTER, JR., *Associate Professor*
(*part time*)

HELEN M. HUNTER, *Associate Professor (part time)*

VAN DOORN OOMS, *Associate Professor*‡

HOWARD PACK, *Associate Professor*

FREDERIC L. PRYOR, *Associate Professor*

BERNARD SAFFRAN, *Associate Professor*‡

WILLIAM J. STULL, *Assistant Professor*

LEWIS R. GATY, *Lecturer*

The courses in economics are designed: first, to acquaint the student with the institutions and processes through which the business of producing, exchanging, and distributing goods and services is organized and carried on; second, to train him in the methods by which these institutions and processes may be analyzed;

‡Absent on leave, 1971-72.

ECONOMICS

and third, to enable him to arrive at informed judgments concerning relevant issues of public policy.

Course 1-2A is prerequisite to all other work in the department except courses 3 and 4. Students intending to major in economics are advised to take Political Science 1 (Elements of Politics) and Economics 4 (Statistics). While not essential, college-level mathematics would also be helpful. Students intending to do graduate work in economics should also take Mathematics 5,6,11, and, if possible, 22. Majors in Course are required to take courses 20 and 21, and course 59 in the senior year. Majors in Honors are advised to take seminars 103 and either 101 or 102. Students intending advanced work in business finance, money and banking, public finance, or public regulation, and those intending to go to law school or business school, will find Economics 3 (Accounting) helpful.

1-2A. Introduction to Economics. This course, which is 1½ semesters in length, 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. It describes the organization of the economic system and analyzes the allocation of resources, the distribution of income, the maintenance of economic stability, and international economic relations. On completing the course, students will have the option of joining seminars in Economics 2B for one half course credit during the last half of the semester.

Staff.

2B. Contemporary Issues in Economics. This course, which is one-half semester in length, is normally taken by students immediately after completion of Economics 1-2A. Each student may elect to join a seminar which meets weekly for intensive investigation, through reading, written reports and discussion, of a contemporary economic topic or problem. Recent topics covered by these seminars have included Issues in Urban Economics; Macroeconomic Models and Computer Simulation; Bonds, Stocks, and the Money Game; Marxism; Experimentation in Social Research; Environmental Economics; and Experiments in Socialism.

3. Accounting. The purpose of this course is to equip the student with the rudiments of accounting that he will need to employ in his advanced work in business finance, banking, taxation, and public regulation.

Spring semester. Mr. Cratsley.

4. Statistics. The course is designed to make the student a critical user of statistics. Topics covered include frequency distributions, sampling, correlation, economic time series, and an introduction to econometric analysis. Students acquire some familiarity with the IBM computer.

Fall semester. Mrs. Hunter.

11. Economic Development. Requisites for the economic development of underdeveloped countries. Obstacles to development. Strategy and tactics of development. Aid for development.

Spring semester. Mr. Pack.

20. Economic Theory. Determination of prices in theory and in practice. Distribution of income. Economic welfare aspects of various market structures.

Fall semester. Mr. Gaty.

21. Money and Banking. Organization and operation of commercial banking in the United States. Central banking, the Federal Reserve system. Macroeconomic and monetary theory. Monetary policy.

Spring semester. Mrs. Hunter.

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22. Public Finance. Social goals and fiscal institutions, Federal, state, and local, including analysis of public expenditures, taxation, the national debt, fiscal federalism, and current fiscal policy.

Fall semester. Mr. Pack.

23. Econometrics. A six-week survey of the theory of multiple regression and the problems encountered in using multiple regression in economic analysis. This will be followed by individual empirical research projects on economic topics selected by students. Admission by permission of the instructor.

Spring semester. Mrs. Hunter.

24. Business Finance. Analysis of private financial instruments, markets, and institutions, and public regulation of financial practices.

Fall semester. Not offered in 1971-72. Mr. Gaty.

25. Labor Problems. The structure and functions of labor unions. Employer approaches to labor relations. Analysis of wage policies. Governmental control of labor relations.

Fall semester. Mr. Pierson.

26. Social Economics. The extent, consequences, and causes of poverty and economic insecurity; an appraisal of reforms in social insurance, medical care, public housing, and rural development; the economics of discrimination and urban ghettos.

Fall semester. Not offered in 1971-72.

27. Managerial Economics. Analysis of business decision-making; economic theory and management control; market structure, pricing, and output; the budgetary process and business planning; business behavior and social welfare.

Fall semester. Not offered in 1971-72.

28. Public Control of Business. Maintenance of competition in American industry; moderation of competition in agriculture, extractive industries, and distributive trades. Regulation of public utilities, transport, and communications. Public ownership and operation of industry.

Spring semester. Not offered in 1971-72. Mr. Gaty.

30. International Economics. Theory and practice of international trade. Balance of payments, foreign exchange, national commercial policies, international investment, and foreign aid.

Fall semester. Mr. Pryor.

31. Comparative Economic Systems. Analysis of methods by which economic systems can be compared; case studies of the Soviet Union, Yugoslavia, and several West European nations.

Fall semester. Mr. Pryor.

41. Urban Economics. The economic structure and development of modern urban economies. Critical analyses of current urban problems and alternative policy solutions. Topics covered will include housing, transportation, ghetto development, urban renewal and local government finance.

Spring semester. Mr. Stull.

45. Psychological Aspects of Economics. Also listed as Psychology 60. A look at selected topics on the border of psychology and economics. Discussions and readings will consider certain problems concerning economic motivation, exchange theory, decision making and rational choice, consumer behavior,

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and the relationships between the economy and personality. A research paper will be required. Prerequisites include two semesters of either Economics or Psychology.

Spring semester. Messrs. Peabody, Pryor and Travers.

47. Marxist Political Economy. Also listed as Political Science 47. A study of Marxist economics and political theory with particular attention to general problems of historical materialism. Primary emphasis in the reading is placed on the works of Marx, Engels, and Lenin; however, some time is also devoted to the background of Marxist thought as well as the development of Marxist theory in the present era. Prerequisites include two semesters of either Political Science or Economics.

Spring semester. Mr. Pryor and Mr. Smith.

59. Economic Stability. National income theory. Analysis of business fluctuations and long-term economic change. Public policies for stabilization and growth.

Spring semester. Mr. Pierson.

75. The Black Worker in American Society. This course will trace the economic status of black workers in this country from the period of slavery to the present. The relative income position and career patterns of black workers will be examined in terms of geographical, industrial and occupational changes, and in terms of the economic, political and institutional influences which have brought about these changes. Relevant policies of union, management and government will also be reviewed. One major feature of the course will be independent investigation and research of contemporary employment problems of black workers.

Enrollment will be limited. Prerequisite: Economics 1.

Spring semester.

HONORS SEMINARS

101. Finance. Social goals and fiscal institutions, Federal, State, and local, including analysis of public expenditures, taxation, the national debt, fiscal federalism, and current fiscal policy. Analysis of private financial instruments, markets, and institutions, and public regulation of financial practices.

Fall semester. Mr. Pack.

102. Economic Stability and Growth. The theory of cyclical fluctuations and secular growth. Money and banking. Monetary and fiscal policy. Wage-price pressures and the control of inflation.

Spring semester. Mr. Pierson.

103. Economic Theory. Contemporary theory: price determination, the functional distribution of income, the level of employment. Evaluation of theory in the light of simplifying assumptions and empirical evidence. The relevance of theory to socio-economic problems.

Each semester. Mr. Hollister.

104. Public Control of Business. The maintenance of competition in American industry. The moderation of competition in agriculture, the extractive industries, and the distributive trades. The regulation of public utilities, transport, and communications. Public ownership and operation of industry.

Spring semester. Not offered in 1971-72. Mr. Gaty.

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105. International Economics. Theory and practice in international economic relations. The pure theory of international trade. The balance of payments and the mechanism of international exchange. Restrictionism and discrimination. Regionalism. Relations with controlled economies. International investment and foreign aid.

Fall semester. Not offered in 1971-72. Mr. Ooms.

106. Comparative Economic Systems. Analysis of methods by which economic systems can be compared; study of resource allocation and growth in socialist, capitalist, and mixed economies; case studies of the U.S.S.R., Yugoslavia, China, France, and other nations; examination of special problems in economic planning.

Fall semester. Mr. Pryor.

107. Labor and Social Economics. The organization of labor. Analysis of wage policies. Government control of labor relations. Problems stemming from income inequality and insecurity. Methods of income maintenance. Economic aspects of education, medical care, public housing. Special topics in urban economics.

Fall semester. Mr. Hollister and Mr. Pierson.

108. Econometrics. Econometric theory and empirical studies. An empirical research paper is required.

Prerequisites: Mathematics 11 and Economics 103.

Spring semester. Not offered in 1971-72. Mr. Saffran.

109. Economic Development. An examination of the problems of economic development and growth in low-income countries, with attention to both historical experience and current issues of development policy. Techniques of economic planning and instruments of policy will be studied. Emphasis will be placed upon case studies of individual countries, and each student will prepare at least one research paper of considerable depth.

Spring semester. Mr. Pack.

110. Urban Economics. This seminar will deal in depth with the economic structure and development of modern urban economies. Research methods appropriate to the analysis of such economies will be discussed and applied to current urban problems. Topics covered will include housing, transportation, ghetto development, urban renewal, and local government finance.

Spring semester. Mr. Stull.

EDUCATION

JOSEPH B. SHANE, *Professor*

ALICE K. BRODHEAD, *Associate Professor and Director of Student Teaching*

BARBARA Z. PRESSEISEN, *Assistant Professor*

There is no major in Education. Swarthmore students may qualify for the Instructional I Certificate for secondary school teachers in Pennsylvania (valid in several other states) by taking a limited pre-professional sequence together with a major or appropriate concentration in one or more of the following fields: Biology, Chemistry, Comprehensive English, Comprehensive Social Studies,

EDUCATION

Economics, French, German, History, Latin, Mathematics, Physics and Mathematics, Russian, Sociology, and Spanish. Students are referred to the pertinent department and to the Program in Education for further information about teacher certification. Courses in Education are not offered solely for students seeking certification, but such students should pursue the following program.

Education 14. Introduction to Teaching.

One of the three introductory courses in Psychology:

Social Psychology, Personality, or Experimental Psychology.

Either Education 11, Learning and Evaluation
or Psychology 15, Child Psychology.

Education 16. Practice Teaching.

One additional course concerned with Education from the following:

Education 12. Principles and Methods of Secondary Education.

Education 15. History of Education.

Education 17. Problems in Urban Education.

Sociology and Anthropology 75. Education and Society.

Sociology and Anthropology 63. Psychological Anthropology.

Psychology 15. Child Psychology.

Psychology 45. Group Dynamics.

11. Learning and Evaluation. Topics will include learning theory and classroom practice, intelligence and ability, test construction and evaluation, and educational research.

Fall semester. Mrs. Presseisen.

12. Principles and Methods of Secondary Education. A study of the principles of secondary education, with emphasis upon aims and organization. Visits to nearby schools are made.

Spring semester. Mr. Shane.

14. Introduction to Teaching. An exploratory course designed to help students determine their own interest in preparing to teach as well as to furnish them with opportunities for learning about elementary and secondary schools. Current educational theory will be discussed and compared with contemporary practice.

Each semester. Mrs. Brodhead and Mrs. Presseisen.

15. History of Education. Not offered 1971-72.

16. Practice Teaching. Supervised teaching with appropriate guidance in subject methods for students who seek teacher certification at the secondary level. Education 14, Introduction to Teaching, and either Education 11, Learning and Evaluation or Psychology 15, Child Psychology are prerequisite. Normally taken for double credit.

Each semester. Mrs. Brodhead and Mrs. Presseisen.

17. Problems in Urban Education. This course considers the problems of schools in big cities, related to topics such as financial support, community relations, professional staff, curricular innovation, pupil personnel. A weekly seminar, individual study, and field investigation in the city of Philadelphia.

Fall semester. Mrs. Brodhead.

Spring semester. Mrs. Brodhead and Mr. Cottingham. [See Political Science 12. Students who elect Problems in Urban Education in the spring semester must take concurrently Urban Sociology and Politics (Political Science 10 or Sociology and Anthropology 59).]

EDUCATION

Linguistics 51. Colloquium in Reading. Cognitive, perceptual, visual, acoustic, and sociological factors related to the problem of reading-acquisition, as well as broader issues in cognitive theory suggested by the problem of explaining reading skills.

Prerequisites: Linguistics 1 or 38 and permission of the instructor.

Fall semester. Mrs. Gleitman.

Mathematics 9. Mathematics for Teachers. The primary objective of this course is to provide a mathematical background to topics appearing in elementary and secondary school curricula. Topics will be chosen from the following areas: the number systems, measurement (length, area, volume), infinity, elementary notions in logic, set theory, topology, game theory, probability and statistics. This course will be useful to students planning to teach mathematics in the schools.

Spring semester. Mr. diFranco.

Psychology 15. Child Psychology. Cognitive development, the socialization process, and the influence of childrearing will be emphasized.

Spring semester. Mr. Travers.

Sociology and Anthropology 75. Education and Society. Comparative study of the functions of schools from the perspectives of sociology and anthropology. Among the topics to be discussed are the relationship of educational institutions to other sectors of society, and the question of alternatives to schooling in both modernizing and "post-industrial" societies.

Fall semester. Mr. Bramson.

ENGINEERING

SAMUEL T. CARPENTER, *Professor and Chairman*

JOHN D. McCRUMM, *Professor*

BERNARD MORRILL, *Professor*‡

CARL BARUS, *Associate Professor**

DAVID L. BOWLER, *Associate Professor*

M. JOSEPH WILLIS, *Associate Professor*

G. STUART PATTERSON, JR., *Assistant Professor*

VICTOR K. SCHUTZ, *Assistant Professor*

MICHAEL S. BARAD, *Lecturer***

The Department of Engineering offers engineering programs directed toward four principal educational aims: to introduce the student to a body of knowledge fundamental to all of modern engineering; to provide him with a comprehensive background in the basic sciences; to allow him maximum flexibility in electing plans of study to suit individual objectives; to provide him the opportunity to study in the humanities and social sciences. The overall plan leading to a degree of Bachelor of Science with the major in engineering is accredited by the Engineers' Council for Professional Development.

*Absent on leave, fall semester, 1971-72.

‡Absent on leave, 1971-72.

**Fall semester, 1971-72.

ENGINEERING

The professional practice of engineering requires skill and resourcefulness in applying scientific knowledge and methods to the solution of engineering problems of ever growing technical complexity. In addition, the role of engineers in our society demands that the engineer recognize and take into account the economic and social factors that bear on his technical problems. The successful engineer will therefore possess an understanding of socio-economic forces, an appreciation of the cultural and humanistic aspects of the society in which he lives, and a sound working knowledge of human relations. Our total program furthers these objectives by providing the student with a broad technical knowledge, together with the foundation of a liberal education.

Courses in the Department of Engineering are open to all students who have the interest and the prerequisite background. Special inquiries may be made through the chairman of the department. Courses 1, 2, 7, 8 and 56 may be especially relevant to some student programs.

The use of the College's computer facilities is central to an engineering education at Swarthmore. The Department has developed a number of courses dealing with computers which would be of interest to students in all departments of the College. These include an introductory course in Digital Computers, a course in Special Computer Topics, and a course in Special Topics—Numerical Analysis for Computers. Additional courses will be offered if the demand warrants.

Educational plans available to engineering students at Swarthmore are as follows:

- (1) Four year course programs with the major in engineering, with elected concentrations of study in the professional branches of engineering such as Civil, Electrical, and Mechanical Engineering, and related engineering areas. (See suggested Elective Plans).
- (2) Four year course programs with the major in engineering, with elected combinations of study in Biology, Chemistry, Economics, Mathematics, Political Science, etc.
- (3) Reading for Honors in Engineering.
- (4) Special combinations to meet unusual needs or interests:
 - (a) A four year program relating engineering with other College areas of study, or
 - (b) A five year program leading to both a B.S. degree with a major in engineering and a B.A. degree.

A candidate for a degree in engineering must meet the general requirements of the College as well as the requirements of the Department of Engineering. Curricular plans for the first two years must take two objectives into consideration: (1) courses should provide an adequate background for work in engineering at the upperclass level, and (2) the satisfying of the general College requirements. During the second semester of the sophomore year the student, following College procedure, will apply for a major in engineering. All four-year programs lead to the degree of Bachelor of Science with the major in engineering.

Course Program

The prerequisites leading to a major in engineering are Engineering 1 and Engineering 2 in the first year and Engineering 11 and Engineering 12 in the second year. Prospective engineering majors are strongly urged to enroll in appropriate courses in Chemistry, Physics, and Mathematics. In special cases, students with preparation comparable to, but differing from, Engineering 1, 2, and 11 may apply to major in engineering after consultation with the department chairman.

ENGINEERING

The departmental requirements beyond those indicated above for the degree of Bachelor of Science with a major in engineering fall into two categories: (1) satisfactory completion of the following courses which are required of all engineering students: Introduction to Fields & Continua, Thermodynamics, and Structure & Properties of Materials; (2) satisfactory completion of an approved program of at least four additional advanced engineering courses, normally elected from those numbered 23 or higher listed under Engineering, Civil Engineering, Electrical Engineering, and/or Mechanical Engineering, with such elections establishing a major field of interest. In determining the total number of engineering courses he may take, a student must bear in mind the general College requirement that at least twenty courses be taken outside of the major field of interest.

All programs leading to a Bachelor of Science degree with the major in engineering must be submitted for approval to the Department of Engineering.

Course Advising

Students are advised to make their educational goals known to their advisers at the earliest possible time. In this way the student can best benefit from the flexibility provided for course election and provide for a curricular program specifically oriented to his future educational goals. The plan for upperclass study in engineering should be formulated during the second semester of the sophomore year when the student applies for a major in engineering.

Reading for Honors in Engineering

Students who wish to become candidates for a Bachelor of Science degree in engineering with Honors should follow the application procedure given on pages 58-60.

A student's program should include seminars and/or other work in engineering and, normally, science and mathematics. A student who wishes to concentrate in civil, electrical, or mechanical engineering may prepare for up to four examination papers in his chosen area. The other two papers will usually be chosen from mathematics, science, or (since the Engineering Department comprises the merged civil, electrical and mechanical departments) a branch of engineering other than the field of concentration.

Elective Plans in the Course Program

The following suggested plans of study for the last two years are listed to indicate the flexibility of choice open to the student. Other plans may also be arranged beyond those suggested. At least four elected and approved advanced courses in engineering must be included in the program of the junior and senior years. Electives in the humanities, social sciences and life sciences can also contribute, in many cases, to the central educational aims. A course in Special Topics or a Thesis is available for meeting special interests or needs.

Suggested Elective Plans

BIO-ENGINEERING

Engineering courses with additional elections in Engineering, Biology, and Chemistry.

The application of engineering principles to biological and medical problems. Students with this interest will normally elect two semesters of biology and two semesters of

ENGINEERING

organic chemistry, and an appropriate sequence of engineering courses. Suggested sequences of study in this interdisciplinary field are available upon request or can be developed with the assistance of your Engineering adviser.

CIVIL ENGINEERING AND RELATED AREAS

General Civil Engineering
Structures
Urban and Regional Planning
Water Resources

The suggested course program in Mechanics of Solids, Structural Mechanics I, Soil Science, Civil Engineering Design, with a fifth course chosen from Fluid Mechanics, Structural Mechanics II, or Soil Engineering. The sequence provides the prerequisites for an additional elective sequence in Structures, Water Resources and Planning, Pre-Architecture, or General Civil Engineering. Plans may be made for work in Bio-Engineering with an emphasis on Environmental Control and Water Resources.

The early planning of electives in Art, Biology, Economics, Political Science, or Sociology, is essential for programs related to Urban and Regional Planning or Water Resources.

ELECTRICAL ENGINEERING AND RELATED AREAS

General Electrical Engineering
Electronics and Information Processing
Systems and Control
Electric Power and Energy Conversion
Engineering Physics

Students who plan to do work in electrical engineering will normally include the following courses in their programs: Circuit Theory, Electromagnetic Theory, Electronic Circuit Theory I (73).

The program should be filled out with additional courses selected partly from those numbered 55 and 74 to 80, inclusive, according to individual interest. The full program may emphasize an area of study such as those listed at the left.

ENGINEERING SCIENCES

A number of feasible programs may be elected from Engineering, Mathematics, Chemistry, Physics, with the engineering courses dealing primarily with the theoretical bodies of knowledge.

A program in Engineering Sciences provides for diversity and depth in engineering, combined with mathematics, chemistry, or physics. It is suitable for those planning to enter college teaching or engineering research after graduate study.

ENGINEERING

ENGINEERING COMBINED WITH STUDY IN OTHER COLLEGE AREAS

Biology
Economics
Mathematics
Political Science
Psychology
Sociology

An engineering student is required to include at least four approved engineering courses beyond the required engineering core. Fourteen electives, including the six to satisfy the College distribution requirements, are available for planning a sequence of study leading to concentrations or diversity in other College areas. The areas listed on the left are not exclusive but they do represent areas in which engineering students may find a strong interest and a relationship to future engineering work.

MECHANICAL ENGINEERING AND RELATED AREAS

General Mechanical Engineering
Applied Mechanics
Thermodynamics and
Energy Conversion
Fluid Mechanics and Heat
Transfer
Engineering Design

Sequences in general mechanical engineering will normally include, in addition to the required engineering core, courses in advanced dynamics, solid mechanics, fluid mechanics and heat transfer, and automatic controls. Courses in thermodynamics, applied mechanics, fluids, heat transfer, and engineering design can be used to develop such specialized sequences as those shown at the left. Plans may be made for work in bio-engineering with an emphasis on the structure and function of biological systems.

ENGINEERING

1. Introduction to Engineering. An introduction to engineering analysis evolving solution to engineering problems through the use of simple mathematical models. The body of mathematics necessary for structuring these models is fully developed within the course. The use of the digital computer is introduced and several engineering problems are assigned for computer solution. During the last four or five weeks of the course, the class is broken up into small seminar groups directed by the engineering faculty and covering various current engineering topics. The laboratory work introduces graphical concepts and some shop practice.

Three class periods and a laboratory each week.

Fall semester.

2. Mechanics. Special areas in the field of mechanics are discussed. Elementary beam theory and theory of torsion constitute the material discussed in the first half of the course. The latter half concerns itself with problems in dynamics which are approached from a Lagrangian point of view.

Three class periods and a laboratory each week.

Spring semester.

ENGINEERING

7, 8. Principles and Problems of Modern Technology. This course is designed to meet the needs of non-science majors and fulfills the group I distribution requirements. (See p. 56.) In the first semester, the logic and programming of the digital computer will be introduced, elementary decision theory will be developed, and the engineering concepts of optimization, feedback, and information discussed. In the second semester, special topics illustrative of modern technological problems and activity will be developed. Topics will be chosen for their timeliness, interest and importance to both society and technology. Past topics have been: world communications, environmental engineering, and bio-engineering. Three class periods and a laboratory every other week.

11. Electrical Science. The subjects to be considered in this course are the following: the analysis and design of electric circuits; force and energy in electromagnetic fields; problems involving static electric and magnetic fields such as, for example, magnetic circuits and dielectric materials. Students registering for this course are assumed to be familiar with the basic concepts of electricity and magnetism.

Three class periods weekly and a laboratory every other week.

Prerequisite: To be preceded or accompanied by Integral Calculus.

Fall semester.

12. Physical Systems Analysis. The study of physical phenomena and systems which may be represented to a good degree of approximation by a linear model or a lumped-parameter pictorial model. The formulation of the mathematical model from basic physical laws and the treatment of the ordinary differential equations resulting therefrom. Emphasis will be placed upon the unity resulting from the mathematical representation for many types of physical systems: mechanical, electrical, electromechanical, thermal, etc. Techniques of analysis will include classical solution of differential equations including power series solutions, and also solution by Laplace transform methods. Transient and steady state response, frequency response, pole-zero concepts, notions of stability, and energy considerations. The analog computer will be used extensively.

Three class periods and a laboratory every other week.

Prerequisite: Engr. 11, or equivalent.

Spring semester.

23. Digital Computer. An introductory course on general aspects of information processors. Topics covered include machine and system organization, languages (including both assembly language and a problem oriented language), applications including Monte Carlo methods, non-numeric data processing, and data banks. There will be extensive use of the College's computer facilities.

Three class periods each week.

No prerequisites.

Fall semester.

24. Special Computer Topics. Topics covered may include systems programming, compiler construction, or more advanced treatment of topics covered in Engr. 23.

Three class periods each week.

Prerequisite: A knowledge of "ASSEMBLER" language.

Spring semester.

ENGINEERING

30, 31. Superproblem in Public Technology. An interdisciplinary group project examining a particular public-service technology including its associated environmental and social problems. The project's goal—i.e., the "superproblem"—is to formulate technical, social and regulatory policies likely to educe net long-term social benefit from the technology in question and minimize social and environmental harm. Examples of such technologies are transportation, electric power, communications, housing, waste disposal-recycling, water supply, and the like.

Credit will be given for a single semester. However, work on a given superproblem is expected to continue for a full year or more, and students are encouraged to stay with a project as long as possible. It is hoped that funds will be available each summer to support a small study group working on the current project. The course is open to all students.

Fall semester. Not offered in 1971-72.

51. Introduction to Fields and Continua. Analysis of field phenomena in a variety of continuous media. Fluid-flow, elastic, thermal, electromagnetic, and other fields are treated with emphasis on their common properties. The partial differential equations governing time-invariant fields, diffusion, wave motion, etc., are developed from basic principles. Application is made to realistic engineering situations.

Three class periods and a laboratory each week.

Prerequisite: Engr. 12, or equivalent.

Fall semester.

53. Thermodynamics. Macroscopic concepts of thermodynamics: temperature, the First Law, thermodynamic properties, reversibility. Statistical inference of thermodynamics: probability, entropy and equilibrium, the partition function. Ideal gases. The Second Law of Thermodynamics. Cycles. Maxwell's Relations.

Three class periods and a laboratory each week.

Fall semester.

55. Systems Theory. Mathematical analysis of an assemblage of interacting elements comprising a generalized system. Fourier methods and the Laplace transform. Linear graphing and operators. Root locus theory. State variables, the system state transition matrix and canonical forms. Linear vector spaces. Probability and stochastic functions. Response to random inputs. Correlation functions and spectral distribution. Some aspects of socio-economic and urban systems. The role of the digital computer in systems analysis.

Three class periods each week; conference or laboratory every other week.

Prerequisite: Engr. 12, or equivalent.

56. Operations Research. 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.

Three class periods each week.

Normally for junior and senior students.

Spring semester.

ENGINEERING

61. Structure and Properties of Materials. Response of materials in a biological, chemical, electrical, mechanical, optical, and thermal environment, in terms of microscopic fundamentals. Design of self-disintegrating materials. Emphasis is on the design, modes of thought, techniques, concepts, and problems of today.

Three class periods each week (fall semester 1971 only).

Three class periods and a laboratory every other week (spring semester 1972 and thereafter)

Prerequisite: Physical Chemistry (fall semester 1971 only). Permission of instructor (spring semester 1972 and thereafter).

Fall semester (1971 only); *spring semester* thereafter.

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.

92. Thesis. With approval, a student may undertake a thesis project as a part of his program in the senior year. The student is expected to submit a prospectus of his thesis problem before the start of the semester in which the thesis project is carried out.

CIVIL ENGINEERING

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.

Three class periods and a laboratory each week.

Prerequisite: Mechanics I, or equivalent.

Fall semester.

62. Structural Mechanics I. Principles of structural systems and advanced mechanics of deformable bodies pertaining to deflection and stability. Structural mechanics of space and plane framed structures including stress analysis, influence lines, and matrix solutions.

Three class periods and a laboratory each week.

Prerequisite: Engr. 59.

Spring semester.

63. Structural Mechanics II. A study of statically indeterminate structural systems and advanced structural theory. Force and displacement methods with matrix applications. Digital computer applications.

Three class periods and a laboratory each week.

Prerequisite: Structural Mechanics I.

Fall semester.

64. Soil Science. Using the basic concepts of physical geology as a unifying framework, the principles of soil mechanics are studied. Subjects introduced include formation of soils, clay mineralogy, transport and deposition of soils, soil type identification, consolidation theory, flow through porous media, stresses in earth masses, and slope stability.

Three class periods and a laboratory each week.

Spring semester.

ENGINEERING

65. Civil Engineering Design. An introduction to the design of engineering structures with emphasis on structural components and structural materials; design projects involving planning, analysis and synthesis, structural models, and optimization criteria.

Three class periods and a laboratory each week.

Fall semester.

66. Structural Design. An advanced course in the design of structures dealing with stability, flat plates, shells, pre-stressed concrete, high strength steels, ultimate design, dynamic force systems, comprehensive design problems, advanced structural model studies.

Three class periods and a laboratory each week.

Prerequisites: Engr. 59, 62, 63, 65.

Spring semester.

67. Environmental Engineering. An introduction to the fundamentals of applied ecology in water resources engineering, with emphasis on pertinent areas of hydrology, hydraulics, and water quality. Fundamentals are related to stream quality management and planning for water resources projects. Opportunity for individual student projects.

Three class periods and a laboratory each week.

Fall semester.

69. Soil Engineering. Advanced principles of soil mechanics with application to problems in design. Theoretical aspects of seepage, settlement and foundation stability analysis. The design of retaining walls, foundations, and earth structures are among the specific topics.

Three class periods and a laboratory each week.

Prerequisite: Engr. 64.

ELECTRICAL ENGINEERING

71. Circuit Theory. Transient and steady-state analysis of electric circuits and networks with emphasis on state variable as well as classical methods and s-plane interpretation. Network topology, equilibrium equations, theorems, network functions and their properties. Energy in electric networks. Matrix formulation for the systematic representation of generalized networks for computer analysis. Linear, nonlinear, time varying and time-invariant cases.

Three class periods and a laboratory each week.

Prerequisites: Engr. 12, or Physics 12.

Fall semester.

72. Electromagnetic Theory. Application of Maxwell's equations. Macroscopic field treatment of magnetic, dielectric and conducting bodies. Forces, motion and energy storage. Field basis of circuit theory. Electromagnetic waves; wave-guides, transmission lines, and antennas.

Three class periods and a laboratory each week.

Prerequisite: Engr. 51, or equivalent.

Spring semester.

ENGINEERING

73, 74. Electronic Circuit Theory. The principal emphasis of the course is on the use of transistors as active circuit elements. The Ebers-Moll, charge control and hybrid- π models are introduced and used, together with appropriate analytical techniques, in such applications as biasing circuits, low-pass amplifiers, tuned amplifiers, power amplifiers, feedback circuits and switching circuits. The bulk of the laboratory work is oriented toward circuit design. Students are encouraged to become familiar with and use the IBM Electronic Circuit Analysis Program which is available in the Computer Center, or the PCAP program.

The first semester provides a working knowledge of some basic aspects of the subject for those who are unable to pursue it further.

Three class periods and a laboratory each week.

Prerequisite: Engr. 12, or equivalent.

75. Electromechanical Energy Conversion. The conversion of energy by means of electromagnetic fields. Electromechanics of lumped parameter systems, force-field relationships, energy storage and transfer in electrodynamic systems. Transducers and rotating machines in engineering practice. Practical engineering aspects of general purpose machines and special electromechanical devices.

Three class periods and a laboratory each week.

Prerequisite: Engr. 12, or equivalent.

77. Topics in Information Transmission. Selected topics relating to the transmission and processing of information and information-bearing signals. Application to communication and information-processing systems.

Three class periods and a laboratory each week.

Prerequisite: Engr. 12, or equivalent.

78. Control Theory and Design. An introduction to classical and modern control theory. Concepts of state, controllability and observability. Analysis and design of linear automatic control systems by means of Nyquist diagram, frequency response and root locus method. Design by matrix methods and state variables. Stability criteria. Computers and logic systems in control. Analog to digital conversion. Introduction to optimum control. Special topics; sampled data systems, nonlinear processes, etc., according to class interest.

Three class periods and a laboratory each week.

Prerequisite: Engr. 12 (and preferably Engr. 55).

80. Physical Electronics. The course begins with a study of the properties of semiconductors based on the quantum mechanical point of view. This background is then used in a detailed consideration of the operation of semiconductor devices. The connection between material properties and the characterization of devices as circuit elements is stressed.

Three class periods and a laboratory each week.

Prerequisite: Engr. 61.

MECHANICAL ENGINEERING

82. Fluid Mechanics. Fluid mechanics is treated as a special case of continuum mechanics for which the relevant equations expressing the conservation of mass, momentum, and energy are derived. Examples and applications are given for the perfect fluid and the linearly viscous fluid. Current research and problem areas in fluid mechanics and heat transport are discussed.

Four class periods each week.

Prerequisite: Ordinary differential equations and multivariate calculus.

ENGINEERING

84. Advanced Fluid Mechanics. A study of the more specialized areas of fluid mechanics: boundary layer theory, compressible flow, wave motions, material-spatial coordinate transformations, and convective heat transfer. Independent work in either an experimental or analytical area is an important part of each student's work.

Four class periods each week.

Prerequisite: Engr. 82.

86. Advanced Thermodynamics. An extension of the basic core thermodynamics, Engr. 53. The fundamental laws of thermodynamics are applied to conventional systems of energy conversion. Principles of irreversible thermodynamics are developed and applied to systems of direct energy conversion.

Four class periods each week.

Prerequisite: Engr. 53.

87. Conduction and Radiation Heat Transfer. A course dealing with the basic introduction to physical phenomena involved in the conduction and radiation heat transfer processes. Work is done in both steady state and transient conditions. Analytical, empirical and numerical approaches are covered.

Four class periods each week.

Prerequisite: Ordinary differential equations.

88. Advanced Dynamics. Review of kinematics and particle dynamics using vectors. Vibrations and stability of lumped parameter system: Rigid body dynamics, including gyroscopes, in vector form. Lagrange's equations and Hamilton's Principle. Vibration of distributed systems.

Four class periods each week.

Prerequisite: Engr. 51.

89. Machine Design. The study of the analysis and synthesis of the elements of machines.

Three class periods and a laboratory each week.

Prerequisite: Engr. 59.

90. Engineering Design. A generalized approach to the design of engineering systems and components is developed stressing inventiveness, engineering analysis and decision making. The design process is studied through case histories and student projects which utilize a number of areas of engineering science. Optimization theory, the use of probability and statistics in design, decision theory, and reliability theory are discussed.

Three class periods and a laboratory each week.

Prerequisite: Senior Engineering standing.

HONORS SEMINARS

Seminars beyond those listed may be arranged on sufficient demand. Suggested seminar areas are: Thermodynamics, Fluid Mechanics, Linear Systems and Electromagnetic Theory.

102. Engineering Systems. This seminar concerns itself with the representation of engineering systems as mathematical models. These models fall into the two fundamental classes of lumped parameters and distributed systems. Emphasis will be placed on the physical meaning of the applied mathematics.

ENGINEERING

109 Thesis. Elective, upon approval of an acceptable field of original investigation.

111. Circuit Theory. Classical and modern treatments of electric circuits and networks. Time-domain and frequency-domain analysis of linear circuits. Analytic properties of network functions and introduction to synthesis. Application of linear graph theory. State variable analysis and computer applications including nonlinear and time-varying cases.

113. Electronics. A study of electronic devices and circuits. Subject matter includes physical theory of electronic devices; design of electronic circuits applicable to communications, instrumentation, information processing systems, etc.; transient and steady-state analysis of electronic circuits and systems; introductory topics in the theory of communication and information. The seminar is accompanied by a full-day laboratory.

ENGLISH LITERATURE

DAVID COWDEN, *Professor*

BRENDAN KENNELLY, *Cornell Visiting Professor*

HAROLD E. PAGLIARO, *Professor and Chairman*

DEREK TRAVERSI, *Professor*

THOMAS H. BLACKBURN, *Associate Professor*

LEE DEVIN, *Associate Professor and Director of The Theatre*

SUSAN B. SNYDER, *Associate Professor*

JOHN S. SHACKFORD, *Assistant Professor*

PHILIP M. WEINSTEIN, *Assistant Professor*

THOMAS L. SHERMAN, *Instructor*

DANIEL MAYERS, *Visiting Lecturer*

ROBERT TEITELBAUM, *Technical Director of The Theatre*

This department offers courses in English literature, American literature, and some foreign literatures in translation. The departmental curriculum is planned to provide experience in several critical approaches to literature, in the intensive study of the works of major writers, the study of the literature of limited periods, and the study of the development of literary types. The department also provides instruction in the techniques of writing.

REQUIREMENTS AND RECOMMENDATIONS

Prerequisites: English 1, or its equivalent by Advanced Placement or by departmental examination, is the prerequisite for all other courses in literature. (This prerequisite does not apply to seniors.) The minimum requirement for admission as a major or as a minor in English is two semester-courses in the department. 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. Students who plan to do graduate work should see a member of the department for early help in planning their programs.

ENGLISH LITERATURE

Major in Course: The work of a major in Course consists of a minimum of eight semester-courses in the department, including Shakespeare (English 61-62), Problems of Literary Study (English 63-64) or its equivalent (English 65-66), and at least two other courses in literature written before 1800; such courses are marked with an asterisk.

Major in Honors: Majors in Honors must prepare three or four papers in the department, two of which must be on subjects covered in seminars in Group I or on other early material decided upon after consultation with the department.

Minor in Honors: Minors in Honors are ordinarily required to prepare two papers in the department.

COURSES

1. Studies in Poetry and Prose. Emphasis on sensitive reading and analysis: exploration of lyrics, longer poetic forms, and imaginative prose works from various periods.

Each semester. Miss Snyder and Messrs. Blackburn, Pagliaro, Shackford, Sherman, Traversi, Weinstein.

10. Advanced Composition. Analysis, organization, and effective presentation of complex subject matter. The course will be conducted for the most part on a tutorial basis.

Spring semester. Staff.

21. The English Lyric. The varieties of lyric poetry, mostly British, with special attention to poetics.

Fall semester. Mr. Sherman.

22. Satire. Examination of satire as a literary genre.

Not offered in 1971-72. Mr. Blackburn.

23. The Development of Realism. Examination of realist authors from Eliot to Joyce.

Spring semester. Mr. Weinstein.

24. Science Fiction. A study of the conventions and achievement of the genre, including a short historical survey of its development.

Spring semester. Mr. Blackburn.

25. Shakespeare (for non-majors). Study of representative plays. Not open to majors in the department.

Each semester. Staff.

26. Criticism and Theory of Literature. Examination of critical theories of literature from classical times to the present.

Fall semester. Mr. Kennelly.

27. Poetry and Drama of the Irish Renaissance. Irish literature of the early twentieth century, including the work of Yeats, Synge, and O'Casey.

Spring semester. Mr. Kennelly.

ENGLISH LITERATURE

29. Black Literature. A survey of Afro-American literature from 1750 to the present. Emphasis will be placed on the modern period, with special consideration given to the "political" dimension of Afro-American writing as a problem in criticism.

Fall semester. Mr. Mayers.

31. Chaucer and Dante.* This course will aim at exploring the civilization of the Middle Ages—a civilization very different from, but relevant to our own—through the works of two of its greatest poets. Emphasis will be placed on a close reading of Chaucer's major poems (*Troilus and Criseyde* and *The Canterbury Tales*) and on the *Divine Comedy*. The reading of Dante's poem will use the original Italian with an English translation to supplement it as required.

Spring semester. Mr. Traversi.

33. Renaissance Poetry.* Lyric and narrative poetry of the Elizabethan age and early seventeenth century. This year, the poetry of Spenser and Donne.

Spring semester. Miss Snyder.

34. Renaissance Comparative Literature.* Selected major writers of the Continental Renaissance studied in translation.

Not offered in 1971-72. Miss Snyder.

35. Tudor-Stuart Drama.* Development of the English drama in the sixteenth and seventeenth centuries.

Fall semester. Mr. Blackburn.

36. Milton.* Study of Milton's poetry with particular emphasis on *Paradise Lost*.

Not offered in 1971-72. Mr. Blackburn.

37. Eighteenth-Century Literature.* Selected writers of England, 1660-1800. This year, reason, irrationality, and imagination, chiefly in the literature of the period.

Spring semester. Mr. Pagliaro.

38. Romantic Poetry. The major English romantic poets, with attention given to the ideas as well as to the form and structure of their major works.

Spring semester. Mr. Pagliaro.

39. The Eighteenth- and Nineteenth-Century English Novel. Study of the beginnings of the novel concentrating on eighteenth-century, romantic, and Victorian novels.

Fall semester. Mr. Cowden.

40. American Transcendentalism 1830-1970. Transcendentalist thought, literature, and art studied in relation to American culture, including: Thoreau, Emerson, Whitman, Melville, Dickinson, Hart Crane, T. S. Eliot, Ginsberg, Henry Miller, N. O. Brown, and abstract expressionist painters.

Fall semester. Mr. Shackford.

41. Nineteenth-Century American Literature. Selected major writers of the period.

Not offered in 1971-72. Mr. Shackford.

42. James, Conrad, and Faulkner. An intensive study of the major works.

Fall semester. Mr. Weinstein.

ENGLISH LITERATURE

43. Victorian Literature. This year, the art of Victorian prose, studied in selected essays and fiction.

Spring semester. Mr. Cowden.

44. Twentieth-Century American Fiction. Selected major writers: Fitzgerald, Hemingway, Faulkner, Nabakov. A study of experimentation with the form of the novel.

Spring semester. Mr. Shackford.

45. Modern Poetry (British). A variety of critical approaches to major British poets of the last hundred years.

Fall semester. Mr. Kennelly.

46. Modern Poetry (American). Selected major poets: Frost, Stevens, Williams, Pound.

Not offered in 1971-72. Mr. Shackford.

47. Contemporary Poetry. Varieties of American and British poetry since 1945.

Spring semester. Mr. Sherman.

48. Theatre: Modern Drama. Examination of the range of dramatic literature since Ibsen.

Spring semester. Mr. Devin.

50. The Modern English Novel. Study of the development of the modern novel beginning with James and continuing to the present.

Not offered in 1971-72. Mr. Cowden.

54. Independent Study. Students who plan independent study must submit a prospectus to the appropriate instructor and receive departmental approval for the project before the beginning of the semester during which the study is actually done.

61-62. Shakespeare. Study of the complete works of Shakespeare, tracing the development of his craftsmanship and ideas. Required of Course majors in the department, who meet weekly in small groups during the first semester of the senior year. Students should read through the plays before beginning the course.

Fall semester. Staff.

63-64. Problems of Literary Study. In the spring semester of the senior year, Course majors in the department pursue a literary problem of their own choosing. They usually begin their work on this essentially independent project either as part of a small group, which meets to discuss a subject agreed upon by students and instructor, or as members of one of certain classes in the regular offering in the Spring semester, whose meetings they attend until their work is under way. After this beginning, the remainder of the semester (approximately half) is devoted to writing a paper of magnitude.

Spring semester. Staff.

65-66. Thesis. Course majors may elect to substitute a thesis for Problems of Literary Study (English 63-64). Application must be made by May 15 of the junior year.

ENGLISH LITERATURE

70. Fiction Writers' Workshop. Projects in imaginative writing. Meetings will be devoted primarily to the analysis of stories submitted by students, and secondarily to the discussion of readings in the theory of fiction, the craft of fiction, and the work of contemporary authors. Admission and credit are granted at the discretion of the instructor.

Spring semester. Mr. Kennelly.

71. Poetry Workshop. A class, limited to twelve, in which students will write, read, and talk about poetry. Students should submit three poems or so for admission to the course. The class will meet once a week together, and in individual conferences. Admission and credit are granted at the discretion of the instructor.

Fall semester. Mr. Kennelly.

72. Theatre: Scene Study. Performance and criticism of scenes from plays; basic acting exercises; introduction to techniques of realism. One-half semester-course of credit. This course may be repeated for credit with the instructor's permission.

Each semester. Mr. Devin.

73. Theatre: Production Workshop. Introduction to theatre technology; problems in lighting, sound, and scene design. One-half semester-course of credit. This workshop may be repeated for credit with the instructor's permission.

Each semester. Mr. Teitelbaum.

74. Theatre: Play Analysis. Examination of playwriting strategies and the solution of problems in dramaturgy. Emphasis on Aristotle's *Poetics* and other "architectural" criticism. Application of critical principles to selected plays.

Fall semester. Mr. Devin.

75. Theatre: Ensemble. An intensive course in theatre technique consisting in a rehearsal period of five weeks, five nights a week, 8:00-11:00 p.m. A company of 14 actors and six technicians is selected at the beginning of each semester through tryouts and interviews.

Each semester. Mr. Devin and Mr. Teitelbaum.

76. Theatre: Design for the Theatre. The philosophic grounding of contemporary theatrical design; practical application of basic technologies.

Fall semester. Mr. Teitelbaum.

80. Religion and Literature.* See Religion 22. Aspects of the relationship between poetic sensibility and religious insight and between the world of religious metaphysics and the imaginative world of the writer. Materials will be taken chiefly from the English traditions of preaching, poetry, and fiction.

Prerequisite: English 1 and one of the Religion courses numbered 3 through 6.
Spring semester. Miss Snyder and Mr. Henry.

HONORS 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.

ENGLISH LITERATURE

103. Chaucer and Dante. This seminar will aim at exploring the civilization of the Middle Ages—a civilization very different from, but relevant to our own—through the work of two of its greatest poets. Emphasis will be placed on a close reading of Chaucer's major poems (*Troilus and Criseyde* and *The Canterbury Tales*) and on the *Divine Comedy*. The reading of Dante's poem will use the original Italian with an English translation to supplement it as required.

Not offered in 1971-72. Mr. Traversi.

104. Milton. Study of Milton's works with special emphasis on *Paradise Lost*.
Spring semester. Mr. Blackburn.

105. Tudor-Stuart Drama. The development of English drama from medieval morality plays to Jacobean tragedy and comedy.

Not offered in 1971-72. Mr. Blackburn.

108. Renaissance Poetry. Poetic modes and preoccupations of the English Renaissance, with emphasis on Sidney, Shakespeare, Spenser, Donne, Herbert, and Marvell.

Spring semester. Miss 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 in 1971-72. Mr. Pagliaro.

110. The Romantic Poets. Examination of the poetry of Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats.

Fall semester. Mr. Pagliaro.

Group II.

113. The Modern Novel. Studies in four novelists: James, Conrad, Joyce, and Woolf.

Each semester. Mr. Cowden.

115. Modern Comparative Literature. Examination of novels by Flaubert, Zola, Eliot, Tolstoy, Dostoevsky, Proust, Lawrence, Joyce, Faulkner, Kafka, Sartre, and Borges.

Each semester. Mr. Weinstein.

116. American Literature. Novelists and poets from the nineteenth and twentieth centuries, representative of the themes, forms, and character of American literature.

Each semester. Mr. Shackford.

118. Modern Poetry. Study of the modern tradition in English and American poetry from Yeats to the present. The seminar will concentrate on the work of major poets.

Spring semester. Mr. Kennelly.

119. Modern Drama. The range of dramatic literature since Ibsen.

Not offered in 1971-72. Mr. Devin.

120. Thesis. A major in Honors may elect to write a thesis as a substitute for one seminar. He must select his topic and submit his plan of work for de-

ENGLISH LITERATURE

partmental approval no later than the end of the junior year. Normally, he writes his thesis, under the direction of a member of the department, during only one of the semesters of his honors work, but not the final semester.

125. 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.

HISTORY

PAUL H. BEIK, *Professor*

JAMES A. FIELD, JR., *Professor*

HARRISON M. WRIGHT, *Professor and Chairman*

ROBERT C. BANNISTER, *Associate Professor*

KATHRYN MORGAN, *Associate Professor*

BERNARD S. SMITH, *Associate Professor*

JEROME H. WOOD, JR., *Assistant Professor*

MARGARET A. YARVIN, *Assistant Professor*

TSING YUAN, *Assistant Professor**

ROBERT D. CROSS, *President*

JAMES F. GOVAN, *Librarian*

WERNER L. GUNDERSHEIMER, *Visiting Lecturer***

The Department of History attempts to give students a sense of the past, an acquaintance with the cultural and institutional developments which have produced the world of today, and an understanding of the nature of history as a discipline. The courses of the department emphasize less the accumulation of data than the investigation, from various points of view, of those ideas and institutions—political, religious, social, economic—by which man has endeavored to order his world.

REQUIREMENTS AND RECOMMENDATIONS

Prerequisites: Any one of the introductory history courses (those numbered 1 through 9, or its equivalent by Advanced Placement, is the prerequisite for advanced history courses open to students of all classes (those numbered 11 through 49). In the sophomore and junior years, with the consent of the instructor and of the department chairman, an advanced course may be taken concurrently with an introductory course. In the senior year advanced courses may, with the consent of the instructor, be taken without prerequisite. The prerequisite for admission to the department as a major in Course or Honors or as a minor in Honors is at least two history courses taken at Swarthmore and a satisfactory standard of work in all courses.

Advanced Placement: The department will grant one semester's credit for incoming students who have achieved a score of 4 or 5 in Advanced Placement history tests. This credit may be counted toward the number of courses required for

*Absent on leave, fall semester, 1971-72.

**Fall semester, 1971-72.

HISTORY

graduation. It may be used in partial fulfillment of the college distribution requirements. It may serve as the prerequisite for advanced courses in history.

Major in Course: The work of the major in Course consists of at least eight semester courses in the department, one of which is History 68. The choice of courses is made so as to prepare for a comprehensive examination, in the spring of the senior year, on three of the four following fields: (1) Ancient, Medieval and Early Modern Europe; (2) Modern Europe; (3) the United States; (4) Africa, Asia, and Latin America. Students are expected to take at least two courses (introductory or advanced) in each of the three fields on which they intend to be examined.

Major and minor in Honors: Students entering the Honors program may elect history as a major or a minor in the Division of the Humanities, in the Division of the Social Sciences, or in cross-divisional programs. Majors in Honors may take either three or four seminars in the department. Minors in Honors are ordinarily expected to take at least two seminars.

General: Students seriously considering a major in history should try to take more than two history courses during their freshman and sophomore years. Those who 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.

1. Early Europe. Europe from the fall of the Roman Empire to the Enlightenment. This course will provide a theoretical and technical introduction to the study of history, stressing the uses of primary sources in literature, religion, philosophy, science, politics, and the arts.

Fall semester. Mr. Smith.

2. Modern Europe. Europe from the Enlightenment to the mid-twentieth century.

Each semester. Mr. Beik or Mrs. Yarvin.

5. The United States to 1877. The colonial experience; independence, a new society and a new government; transcontinental expansion and the struggle between North and South.

Fall semester. Mr. Bannister.

6. The United States Since 1877. Industrialism and its consequences; the United States as a great power; the problems of a shrinking world.

Spring semester. Mr. Field.

8. Africa. African history and civilization, with an emphasis on tropical Africa in modern times.

Fall semester. Mr. Wright.

9. China. The formation and maturing of Chinese civilization.

Spring semester. Mr. Yuan.

10. Freshman-Sophomore Seminar. Collaborative small group investigation of subjects within the particular fields of interest of members of the department.

Fall semester. Not offered in 1971-72.

HISTORY

11. Early Medieval Europe. The history of western Europe from the accession of Diocletian to the last Carolingians.

Fall semester. Mr. Smith.

12. Later Medieval Europe. The history of western Europe from the tenth to the fifteenth century, with emphasis on the role of the Papacy.

Spring semester. Mr. Smith.

13. England to 1485. The political, cultural, and religious history of England from the Roman occupation to the accession of the Tudors.

Fall semester. Mr. Smith.

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.

Prerequisite: History 11 or History 12.

Not offered in 1971-72. Mr. Smith.

16. The Renaissance. The birth of modern western civilization considered in terms of intellectual and artistic developments and their relation to economic, social, and political conditions.

Not offered in 1971-72.

17. The Reformation and the Seventeenth Century. The attempt to reform religion, its failure, and the subsequent secularization of culture and society.

Not offered in 1971-72.

18. Tudor and Stuart England. The English Renaissance and Reformation, constitutional developments and the origins of radical politics, the Civil War, the Restoration and the Glorious Revolution.

Not offered in 1971-72.

Classics 31. History of Greece. (See listing under Department of Classics.)

Classics 32. The Roman Republic. (See listing under Department of Classics.)

Classics 42. Greece in the Fifth Century B.C. (See listing under Department of Classics.)

Classics 44. The Roman Empire. (See listing under Department of Classics.)

21. The French Revolution and Napoleon. The place of the French Revolution and Napoleon in the development of European political institutions and social theories.

Fall semester. Mr. Beik.

22. French Regimes since Napoleon. The succession of political shocks and readjustments from 1814 to the present, studied in the context of social changes and popular aspirations.

Not offered in 1971-72. Mr. Beik.

24. Modern England. The development of constitutional government and the transition from an agricultural and aristocratic nation to an urban and socialist one.

Spring semester. Mr. Govan.

HISTORY

25. Modern Russia. The course begins with the reign of Peter and gives half its time to the twentieth century.

Spring semester. Mr. Beik.

26. Modern Germany 1815-1950. Germany's transformation from a people in search of a national state to a national state in search of world power.

Mrs. Yarvin.

28. 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; nationalism, racism, militarism in their historical context; the first effective experiments in the use of ideology, technology, and terror as means of social control; the political responses to the crises of modernization and industrial capitalism.

Fall semester. Mrs. Yarvin.

29. Topics in European History. Offered as opportunity permits. In 1971-72 the course will be devoted to the intellectual history of nineteenth century Europe.

Fall semester. Mrs. Yarvin.

30. The American Colonies. The transit of civilization to British North America, and the modification of Old World ideas and institutions in a New World environment, 1607-1763.

Fall semester. Mr. Wood.

31. 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.

Spring semester. Mr. Wood.

32. American Intellectual History to 1865. The history of ideas in the United States from the colonial period through the mid-nineteenth century. A general knowledge of the political and social history of the period is assumed.

Fall semester. Mr. Wood.

33. American Intellectual History since 1865. The history of ideas in the United States from the mid-nineteenth century to the present time. A general knowledge of the political and social history of the period is assumed.

Spring semester. Mr. Bannister.

34. America in the Progressive Era, 1896-1920. The attack on political privilege and the movement for the control of industry; urban poverty, the new immigration, race relations, womens rights, temperance, and conservation; the emergence of America as a world power.

Spring semester. Mr. Bannister.

35. American Diplomatic History 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."

Fall semester. Mr. Field.

HISTORY

36. American Diplomatic History 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."

Spring semester. Mr. Field.

37. American Religious Thought. The course of religious thought in the colonies and the United States, with appropriate reference to general intellectual history and American church history.

Fall semester. Mr. Cross.

38. Topics in American History. Intensive study of particular problems. Offered as opportunity permits. Limited enrollment. In 1971-72 the subject will be higher education and American society from colonial times to the present.

Fall semester. Mr. Bannister.

Religion 38. Quakerism. (See listing under Department of Religion.)

40. Introduction to Afro-American History. An interdisciplinary survey of the black experience in the United States from 1619 to the present. The major thrust of the course will be to examine black views on politics, science, education, and philosophy, as well as black perspectives on race relations.

Fall semester. Mrs. Morgan.

41. Topics in Afro-American History. A course of limited enrollment devoted to an investigation into the sources, problems, and methods involved in the study of black history, with special emphasis on folk history.

Spring semester. Mrs. Morgan.

42. Topics in African History. Special problems in African history. Offered as opportunity permits. Limited enrollment. The topic in 1971-72 will be South Africa, with an emphasis on White-Black relations.

Spring semester. Mr. Wright.

43. The Expansion of Europe. A survey of European overseas expansion since 1415, and of its impact on non-European societies. The emphasis is on South and Southwest Asia.

Not offered in 1971-72. Mr. Wright.

44. Modern China. The search for a modern Chinese identity since 1840. This course will concentrate on such themes as the impact of the West on the traditional Confucian society, reform and revolution, the failure of democratic liberalism, and the adaptation of Marxism to China.

Spring semester. Mr. Yuan.

45. Modern Japan. The transformation of Tokugawa Japan into a modern nation, with emphasis on westernization, imperialism, and the search for national identity.

Not offered in 1971-72. Mr. Yuan.

46. Asian Nationalisms. A comparative study of middle eastern and far eastern Asian nationalisms, with emphasis on the Turkish, Arab, Chinese, and Japanese forms.

Not offered in 1971-72. Mr. Yuan.

HISTORY

48. Latin America. The development of the Latin American countries from colonial times to the present.

Spring semester. Mr. Wood.

51-2. Colloquium. A double-credit course of restricted enrollment which seeks, through intensive investigation of a limited topic, to illuminate an important historical field. Open to majors in Course in any department. In 1971-72 the subject will be *Transnationalism*: economic, technological, and cultural transcendence of national boundaries in the nineteenth and twentieth centuries; the emergence of "world city," "world farm," and "world culture."

Fall semester. Mr. Field.

53. 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 53 may be taken for one-half credit as History 53A.

Members of the department.

67. Thesis. With the consent of the chairman and of the supervising member of the department a thesis may be substituted for a course in the fall semester of the senior year.

Members of the department.

68. Special Topics. Group meetings of senior majors in their final semester to review, integrate, and supplement their programs. The readings and discussion center on the development of historical writing from the Middle Ages to the present, on the relationship of the historian to his time, and on historical method and its problems.

HONORS SEMINARS

The following seminars are offered by the department to juniors and seniors who are preparing to be examined for a degree with Honors. They may be taken in any combination and 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.

Those who wish to specialize in international relations with a major in history (see page 135), should include in their programs at least three of the following seminars: 128, 134, 140, 144.

111. Medieval Europe. The course of European civilization from the conversion of Constantine to the foundation of the western kingdoms.
Prerequisite: History 11 or the permission of the instructor.

Spring semester. Mr. Smith.

116. The Renaissance and Reformation. The birth of Modern Europe as seen in such developments as the recovery of classical culture, the crisis of religion and the Church, the establishment of centralized polities, and the origins of modern science.

Fall semester. Mr. Gundersheimer.

118. Tudor and Stuart England. The English Renaissance and Reformation, constitutional developments, the Civil War and the Restoration.

Spring semester. Not offered in 1971-72.

HISTORY

- 122. Europe 1760 to 1870.** The disintegration of the old regime and the rise of liberalism.
Fall semester. Mr. Beik.
- 123. Europe 1870 to 1945.** Political and social changes in Europe through the Second World War.
Each semester. Mrs. Yarvin.
- 124. England Since 1785.** The rise of the first modern industrial state. Its social, political, and economic problems.
Spring semester. Mr. Govan.
- 128. Eastern Europe.** The origins and consequences of the Russian Revolution and the development of the nations of East Central Europe.
Spring semester. Mr. Beik.
- 130. Early American History.** Political, economic, social, and cultural aspects of the period from the explorations to the early National period.
Spring semester. Mr. Wood.
- 132. Problems in American History.** Selected topics in the history of the United States.
Each semester. Mr. Bannister, Mr. Field or Mr. Wood.
- 134. Problems in American History: Foreign.** A study of the evolution since 1776 of American relations with the outer world with emphasis on ideological, economic, and strategic developments.
Fall semester. Mr. Field.
- 140. Modern Africa.** Studies in African history with emphasis on the period since 1800, the region south of the Sahara, and the European impact.
Fall semester. Mr. Wright.
- 144. The Modern Far East.** Political, social, and intellectual movements in China and Japan since about 1840.
Spring semester. Mr. Yuan.
- 167. Thesis.** With the permission of the department Honors students 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 students wishing to write a thesis for single credit should elect History 67.

INTERNATIONAL RELATIONS

Students who plan to enter upon a career in the field of international relations 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 a modern language.

INTERNATIONAL RELATIONS

These students who wish to concentrate in international relations may take their Senior Comprehensive Examination in this field. Students preparing for this examination should take eight, nine, or ten courses from among those listed below, including all of those listed in Group I, one or more in Group II, and one or more in Group III. The examination is administered by a committee appointed by the chairmen of the Departments of Economics, History, and Political Science, under the chairmanship of the Department of Political Science.

Group I

- Political Science 4. *International Politics*
- Political Science 13. *International Law and Organization*
- Political Science 14. *American Foreign Policy*
- Political Science 63. *Advanced International Politics*
- Economics 30. *International Economics*

Group II

- History 8. *Africa*
- History 25. *Modern Russia*
- History 35. *American Diplomatic History to 1900*
- History 36. *American Diplomatic History since 1900*
- History 43. *The Expansion of Europe*
- History 44. *Modern China*
- History 45. *Modern Japan*
- History 46. *Asian Nationalisms*
- History 48. *Latin America*

Group III

- Economics 11. *Economic Development*
- Economics 31. *Comparative Economic Systems*
- Political Science 3. *Comparative Politics*
- Political Science 18. *Politics of Developing Nations*
- Political Science 19. *Comparative Communist Politics*
- Political Science 20. *Politics of East Asia*
- Political Science 21. *Politics of Africa*
- Political Science 55. *Modern Political Theory*
- Political Science 64. *Topics in International Relations*

Students who plan to enter the Honors program will find it possible to select a similar combination of courses and seminars in the field of international relations. In planning such programs, they should consult with the chairman of their prospective major department.

LINGUISTICS

LILA R. GLEITMAN, *Associate Professor*

NANCY DORIAN, *Visiting Lecturer*

Linguistics is the study of human language. The discovery and description of universal features characterizing all human languages is the primary theoretical goal. Specifically, *synchronic* or *descriptive linguistics* is the study of the syntactic, phonological, and semantic structure of language; *diachronic* or *historical linguistics* approaches these issues through the study of genetic language relation-

LINGUISTICS

ships. Students of individual languages and students of mathematics and philosophy may find work in linguistics relevant to their academic concerns. Further, linguistic studies are closely linked with broad issues in the social sciences. Possible connections between language typology and culture have made language a central concern of anthropologists and sociologists. Psychologists have recognized that language studies bear on fundamental issues in human cognitive organization. The resulting collaboration between linguists and psychologists (*Psycholinguistics*) is among the more hopeful current directions in the study of human development and cognition.

A major in linguistics is not offered, but a joint major in linguistics and psychology is available in Course. Honors students may minor in linguistics. Following are the requirements (11 course units) for the joint major:

- (a) Linguistics 1 and 2 (Introduction to the study of language)
- (b) At least one course from the following:
 - Psychology 15. *Child Psychology*
 - Psychology 43. *Psychology of Communication*
- (c) Three courses from among the following:
 - Linguistics 38. *Reading and Writing*
 - Linguistics 52. *Diachronic Linguistics*
 - Linguistics 68. *Directed Reading or Research*
 - Linguistics 107. *Language and Thought*
 - Linguistics 108. *Transformational Grammar*
 - Sociology 26. *Language, Society and Culture*
- (d) Five courses (or four, in case both Psychology 15 and Psychology 43 are chosen) from among:
 - Psychology 12. *Experimental Psychology*
 - Psychology 37. *Learning and Behavior Theory*
 - Psychology 46. *Cognitive Processes*
 - Psychology 50. *Perception*
 - Psychology 54. *Methods of Psychological Research*
 - Psychology 64. *History and Systems of Psychology*

1. Introduction to Linguistics. Languages of the world; language change; dialect; human and animal languages; concepts in synchronic linguistics; syntax, semantics and phonology; transformational and structural grammars.

Fall semester. Mrs. Gleitman.

2. The Psychology of Language. Developmental linguistics (acquisition of a first language); the origins of language; the perception and use of language; bilingualism; linguistic abnormalities; dialect and the social context; linguistic determinism; issues in cognitive psychology; reading and writing.

Prerequisites: Linguistics 1 or permission of the instructor.

Spring semester. Mrs. Gleitman.

38. Reading and Writing. This course is designed primarily for students involved in reading tutorial programs, and for those intending to teach. At issue is the problem of reading in both its conceptual and social aspects. Students will tutor or assist in teaching reading as part of the course work. Weekly meetings with the instructor will concern theoretical issues in phonology, reading and writing; methods of teaching; and discussion of the ongoing tutorial programs.

Not offered 1971-72.

LINGUISTICS

51. Colloquium in Reading. Cognitive, perceptual, visual, acoustic and sociological factors related to the problem of reading-acquisition, as well as broader issues in cognitive theory suggested by the problem of explaining reading skills. Prerequisites: Linguistics 1 or 38 and permission of the instructor.

Fall semester. Mrs. Gleitman.

52. Diachronic 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. The history of the English language, as the language common to all participants, will be central to the course.

Prerequisite: Permission of the instructor.

Fall semester. Miss Dorian.

53. Recreational Linguistics. An approach to questions of language organization through a survey of language games: crypts, ciphers, puns and anagrams; bridge bidding and other special-purpose languages; signs, creoles and pidgins. Prerequisite: Linguistics 1. Not offered 1971-72.

68. Directed Reading or Research. Students may conduct a reading or research program in consultation with the instructor (permission of the instructor required).

Either semester. Mrs. Gleitman.

106b. Cognitive Development. (see Psychology 111).

107. Language and Thought. Philosophical, psychological and linguistic approaches to the problem of meaning.

Prerequisite: Linguistics 1 and 2.

Spring semester. Mrs. Gleitman.

108. Transformational Grammar. Not offered 1971-72.

MATHEMATICS

DAVID ROSEN, *Professor and Chairman*‡

JAMES W. ENGLAND, *Associate Professor*

STEVENS HECKSCHER, *Associate Professor*

EUGENE A. KLOTZ, *Associate Professor and Acting Chairman*

J. EDWARD SKEATH, *Associate Professor*

ROLAND B. DI FRANCO, *Assistant Professor*

THOMAS W. HAWKINS, *Assistant Professor*

Pure mathematics is an abstract subject and may be looked upon as the model of a deductive science. On the other hand, the subject matter of mathematics has for the most part arisen out of concrete applications to the physical sciences, among which geometry occupies a central position. The courses offered in the Department of Mathematics attempt to combine these points of view and to give

‡Absent on leave, 1971-72.

MATHEMATICS

a picture of the power and beauty of the subject when studied for its own sake, as well as its many relations to other fields of thought. The study of mathematics is essential as a tool for the understanding of the principles of the physical sciences and engineering; a knowledge of its techniques is indispensable for a successful pursuit of these subjects. The same is becoming increasingly true in the biological sciences and the social sciences.

The sequence consisting of Courses 5, 6, 11, 22 forms the normal preparation for further work in mathematics as well as for work in physics, other sciences, and engineering. Those students who have obtained a grade of 3 or better on the Advanced Placement AB examination normally take Course 6 while those who similarly qualify in the BC examination normally take Course 11.

A student who wishes to major in mathematics in Course must complete six courses in addition to the normal sequence of four courses listed above. It is expected that a Course major in mathematics will take some advanced courses from the three major areas, namely analysis, algebra, topology-geometry. Physics 1, 2 is highly recommended and a reading knowledge of French, German, or Russian is desirable for all mathematics majors.

In order to be admitted to the Honors program with work in mathematics a student must have completed Course 22. An Honors student with a major in mathematics will normally take in his junior year seminars 101 (Real Analysis), and 102 (Modern Algebra). In his senior year he will normally take seminars 103 (Complex Analysis), and 104 (Topology); or 105 (Probability and Statistics).

An Honor student minoring in mathematics will normally offer two papers in mathematics. A student may use Course 51, 52 as partial preparation for an Honors paper in mathematics.

Mathematics majors in Course or Honors automatically meet the mathematics requirements for being certified to teach mathematics in secondary school. Minimum requirements for certification in mathematics are: (a) 5 and 6; (b) one course from 24, 41, 42, 102; (c) one course from 23, 53, 104; (d) two additional courses that may be taken from 11, 14, 22, 30, 51, 52, 103, 105. Certification to teach mathematics in secondary school requires departmental recommendation.

1. Elementary Statistics. This is a non-calculus statistics course available to students in all disciplines. It does not satisfy any mathematics prerequisite nor can it be counted toward a major or minor in the department. The course begins with an introduction to discrete probability, and then shifts to methods and techniques of statistical inference such as assembling and handling data, estimation of parameters, hypothesis testing, correlation and regression analysis. Other topics will be considered as desired by the class.

Fall semester. Mr. Mullins.

3, 4. Probability and Calculus. This course, which covers the basic concepts of probability theory and one variable calculus, is particularly useful for biology and social science majors. Topics to be included are discrete probability, sequences, series, differentiation, integration, transcendental functions, extremal problems, and an introduction to continuous probability and statistical techniques, as time permits.

Year course. Mr. Heckscher.

5. Differentiation and Integration. This is an introductory calculus course which presupposes such normal high school mathematics as algebra, analytic geometry, and elementary trigonometry. Derivatives and integrals of functions of

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one variable are studied in detail. Applications of the methods of calculus are given, when possible.

Fall semester. Mr. England.

6. Topics in Calculus. Topics to be included are infinite series, techniques of integration, transcendental functions, improper integrals and an introduction to differential equations.

Prerequisite: Math 5 or its equivalent, or a grade of 3 or better on AB Advanced Placement.

Both semesters. Mr. diFranco.

9. Mathematics for Teachers. The primary objective of this course is to provide a mathematical background to topics appearing in elementary and secondary school curricula. Topics will be chosen from the following areas: the number systems, measurement (length, area, volume), infinity, elementary notions in logic, set theory, topology, game theory, probability and statistics. This course will be useful to students planning to teach mathematics in the schools.

Spring semester. Mr. diFranco.

11. Linear Algebra. This course is the normal sequel to Math 6. It introduces the student to vector spaces, matrices, and linear transformations, with applications to the solution of systems of linear equations, determinants and the eigenvalue problem.

Prerequisite: Math 4 or 6. Freshmen who score a grade of 3 or better on BC Advanced Placement examination may begin with this course.

Both semesters. Mr. diFranco, Mr. Skeath.

12H. Analytic Geometry. This half course presents applications of linear algebra to the geometry of n -space with special emphasis on $n=2$, and 3. It will include such topics as lines, planes, and their higher dimensional analogs; euclidean spaces, orthogonality, least squares, rigid motions, symmetric matrices, quadratic forms, classification of surfaces corresponding to second degree equations.

Prerequisite: Math 11. Not offered in 1971-72.

14. Probability and Statistics. This course deals with the mathematical theory of statistics, based upon a study of the concepts of probability. An introduction to sampling and statistical inference will be given.

Prerequisite: Course 5.

Fall semester. Mr. Klotz.

17. Set Theory. Set theory will be presented in an axiomatic framework. The course will include: operation on sets, well ordering and well founded relations, transfinite induction, ordinal numbers, axiom of choice and its equivalents, cardinal numbers and their arithmetic, and construction of the real numbers.

Prerequisite: permission of the instructor.

Not offered in 1971-72.

19. The Mathematics of Social Choice. This course is concerned with the mathematical problems involved in going from the preferences of individual members of a society to a collective decision by the society. It is of special interest to students in economics, sociology, political science, psychology, and philosophy, as well as mathematics.

Prerequisite: permission of the instructor.

Fall semester. Mr. Klotz.

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22. Several Variable Calculus. This course considers differentiation and integration of functions of several variables with special emphasis on two and three dimensions. It is the normal sequel to Math 11 and is a prerequisite for several other mathematics courses.

Prerequisite: Math 11.

Spring semester. Mr. Skeath

23. Higher Geometry. This course considers an assortment of specialized topics in geometry that are important in the present stream of mathematics. The material consists of parts of euclidean geometry, convexity, and transformation theory which will also relate to other courses in mathematics. The emphasis will be on the theory of convex sets and the theory of congruence and similarity in euclidean two space and three space.

Prerequisite: Math 11.

Fall semester. Not offered in 1971-72.

24. Introduction to Modern Algebra. This course, which is offered in alternate years, is especially designed to accommodate those people who desire to be certified to teach mathematics in secondary school or who desire a brief 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 11 or permission of the instructor.

Spring semester. Not offered in 1971-72.

30. Differential Equations. An introduction to differential equations that will include such topics as: first order equations, linear differential equations, approximate methods, some partial differential equations.

Prerequisite: Math 11.

Spring semester. Mr. Hawkins.

33. Graph Theory. This course is an introduction to graph theory and its applications. Topics included will be chosen from the following: undirected and directed graphs; partitions, chains, and circuits; the Kuratowski characterization of planar graphs; coloring theorems; matrix representations; and applications of graph theory to such areas as linear programming, combinations, biology, engineering, and physics.

Prerequisites: Math 11, or Math 22, or permission of the instructor.

Spring semester. Mr. Heckscher.

34. Numerical Methods. This course will deal with the numerical solution of various mathematical problems, pure and applied. A laboratory period will be included, and a knowledge of computer programming will be useful.

Prerequisite: Math 11.

Spring semester. Mr. Klotz.

35. Mathematics for the Social Sciences. This course will deal with various topics in mathematics that have arisen from the social sciences. Topics include such areas as Markov chain models, simulation, linear programming, game theory, utility theory, and graph theory with applications to organization theory, integer programming and optimal assignment problems. Examples will be drawn from economics, political science, psychology and sociology-anthropology. Some computer programming may be included.

Prerequisite: Math 11.

Spring semester. Not offered 1971-72.

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41. Groups and Representations. An introduction to the theory of abstract groups with application to such areas as symmetry groups, followed by the elements of representation theory.

Prerequisite: Math 11.

Fall semester. Mr. Hawkins.

42. Applied Modern Algebra. Topics will be selected from such areas as Boolean algebras, finite state machines, programming languages, optimization and computer design, and coding theory.

Prerequisite: Math 11 or permission of the instructor.

Not offered in 1971-72.

51, 52. Applied Real Analysis. This course considers techniques of applied mathematics from the viewpoint of linear spaces and operators. Topics to be covered are a brief introduction to complex function theory, spectral theory of operators, Green's function, eigenvalue problems of ordinary differential equations, and partial differential equations.

Year course. Mr. Hawkins.

53. Topology. This course is intended to bridge the gap between Advanced Calculus and certain topics in abstract mathematics. The topics covered will vary from year to year and will be selected from those topics in seminar 104.

Not offered in 1971-72.

56. Topics in the History of Mathematics. A detailed examination of the development of various lines of mathematical thought in the nineteenth and early twentieth centuries that have become fundamental to contemporary mathematics. Topics to be covered will include: the development of real analysis (including set theory, measure and integration theory, and Fourier series); the introduction of imaginaries into analysis and the creation of complex function theory; the origins of the notion of an abstract topological space; the emergence of algebraic structures.

Prerequisite: permission of the instructor.

Spring semester. Mr. Hawkins.

HONORS SEMINARS

101. Real Analysis. This seminar concentrates on the careful study of the principles underlying the calculus of real valued functions of real variables.

Not offered in 1971-72.

102. Modern Algebra. This seminar deals with the theoretical properties of such formal systems as groups, rings, fields and vector spaces. While these concepts will be illustrated by many concrete examples, the emphasis will be on the abstract nature of the subject.

Spring semester. Mr. Klotz.

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.

Prerequisite: Math 22.

Fall semester. Mr. Heckscher.

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104. Topology. The subject matter of this semester will include such topics as point set topology with some application, piecewise linear topology, homology and homotopy theory.

Not offered in 1971-72.

105. Probability and Statistics. The purpose of this seminar is to give the mathematical background necessary for an understanding of the mathematical analysis of statistical data. In addition, the modern development of this subject provides a valuable application of the concepts and techniques acquired in the study of advanced calculus. The topics treated may include: the axiomatic approach, the use of Stieltjes integrals, correlation and regression, some special distributions, sampling theory, and a short introduction to the theory of statistical estimation.

Spring semester.

106. Models of Set Theory. This seminar will study various models for set theory. The primary emphasis will be on those models which exhibit the relative consistency and independence of the axiom of choice and the continuum hypothesis.

Prerequisites: Math 17, Set Theory, and Phil. 12, Logic, or equivalent work.

Spring semester. Mr. diFranco.

107. Modern Analysis. This seminar deals with the foundations of global analysis and includes some applications to mechanics. Honors majors may use this seminar instead of Mathematics 101 for their program, or take it in addition to Mathematics 101.

Fall semester. Mr. England.

MEDIAEVAL STUDIES

Coordinator: PATRICK HENRY

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 perceptible unity and a critical importance for the understanding of Western culture, can be approached only through a combination of several disciplines. Hence eight Departments (Art History, 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 Course or Honors.

For a major in Course the requirements are as follows:

1. Latin 13: Mediaeval Latin
1 course in Mediaeval History (History 11 or 12)
Either Philosophy/Religion 19 or History 14.
The prerequisites for the above courses 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 (16, 17, 20).
History (11, 12, 13, 14).
Religion (11, 18, 19, 23).
Literature (Classics 35; English 31; CEL 13; French 22; Spanish 20).
Music (15).
3. A student may elect to 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 his senior year based on courses taken in the mediaeval field.

For a major in Honors 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 prior to admission to Honors.
2. Seminars may be chosen from the following: Philosophy 110 (Mediaeval Philosophy), History 111 (Mediaeval Europe), Art History 103 (Mediaeval Art), English 103 (Chaucer and Dante); French 100 (Littérature du Moyen-Age); Latin 104 (Mediaeva! Latin).
3. By attachments to the courses listed above, and by writing a thesis, the student may expand the possibility of work in Honors beyond these six seminars.

The minor program should be planned with the co-ordinator so as to insure a close relation to the major. No minor program 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

- HILDE D. COHN (German), *Professor*
FRANZ H. MAUTNER (German), *Professor*
FRANCIS P. TAFOYA (French), *Professor and Chairman*
ELISA ASENSIO (Spanish), *Associate Professor*
GEORGE C. AVERY (German), *Associate Professor*
JEAN ASHMEAD PERKINS (French), *Associate Professor*
GEORGE KRUGOVOY (Russian), *Associate Professor*‡
PHILIP METZIDAKIS (Spanish), *Associate Professor*‡
THOMPSON BRADLEY (Russian), *Assistant Professor*
ROBERT ROZA (French), *Assistant Professor*
SIMONE VOISIN SMITH (French), *Assistant Professor*
RICHARD TERDIMAN (French), *Assistant Professor*
NORMA B. GRASSO (Spanish), *Instructor*
MARCIA ROSE SATIN (Russian), *Lecturer*
OLGA FERNANDEZ CONNOR (Spanish), *Lecturer*
ANNE MENARD (French), *Lecturer*
ELKE PLAXTON (German), *Lecturer*
HELEN P. SHATAGIN (Russian), *Lecturer*

The purpose of the departmental major is to acquaint students with the important periods and major figures in the literature of France and other Franco-phone countries, the German-speaking countries, Russia, Spain and Latin America, and in the process to develop an appreciation of literary values, to provide training in critical analysis and foster an understanding of the interplay between literary phenomena and the historical and cultural forces underlying the various literary traditions.

Courses numbered 1B through 6 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 literary texts. For a detailed description of the orientation in these courses see the Explanatory Note on language courses below. Courses numbered 11 or above stress the study of literature as a humanistic discipline but also have as one of their aims the achievement of competence in the spoken and written language.

Students planning to major in a foreign language and its literature are advised to present enough credits (three to four years at the high school level) upon admission to enable them to register for courses numbered 11 and 12 in their freshman year or at the very latest by the beginning of the sophomore year. Students who enter with no previous knowledge of the language but who are interested in majoring in a foreign literature should register for intensive language courses (1B-2B) in their freshman year. Language courses numbered 1B through 5 do not count toward the minimum of eight courses required for the major.

‡Absent on leave, 1971-72.

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Students who want to continue a language begun elsewhere will be placed at the course level where they will profit best according to the rating of the College Entrance Examination or placement tests administered by the department. Students who place in courses numbered 1 through 3B must in addition take the Modern Language Aptitude Test during freshman orientation. Students beginning their study of a foreign language at Swarthmore are also required to take the Modern Language Aptitude Test.

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 specialization. Students who speak French, German, Russian or Spanish fluently should consult with the department before electing courses.

Majors are urged (a) to elect supporting courses in other literatures (classical or modern), History, Philosophy, Linguistics and Art History; (b) to investigate seriously the possibility of spending at least a summer and a semester abroad. Interested students should request advice concerning timing and assistance of departmental advisers familiar with programs in foreign countries.

Students wishing to receive teaching certificates 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 and courses in the foreign history and culture to prepare them for the MLA Foreign Language Test for Teachers and Advanced Students. This examination consists of seven sections: the four basic skills (listening, speaking, reading and writing), Applied Linguistics, Culture, and Professional Education. In order to be certified, students must pass this examination at the level of "good." Prospective teachers of a foreign language are urged to include in their program at least a summer and a semester abroad.

Students planning to do graduate work are reminded that, in addition to the language of specialization, a reading knowledge of other languages is generally required for admission to advanced studies. Students who need advice concerning the choice of languages should consult with the department.

Continental European Literature

(Courses conducted in English)

Students acquainted with a particular foreign language would do best to elect the appropriate literature course taught in the original language and not the corresponding CEL 12 or CEL 50, though they might well take one in another literature. These courses may be used to satisfy the distribution requirements, but cannot be substituted for the 11 or 12 level courses in the original languages to satisfy the departmental prerequisites for a major or minor. The CEL 50s may in some cases form an appropriate part of the upper-level work in the major in one of the foreign literatures or serve as the basis of preparation for an Honors paper. Students planning programs where such considerations would apply must consult with the department.

CEL 12 and CEL 50 courses will be offered according to the following sequence (other CEL courses listed after 50S):

1971-72

Fall

CEL 12 Spanish
CEL 50 French

Spring

CEL 12 Russian
CEL 50 German

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1972-73

Fall

CEL 12 French
CEL 50 Spanish

Spring

CEL 12 German
CEL 50 Russian

12F. Man and Society in French Literature. An examination of the double tradition of introspective individualism and deep social concern—and the inevitable conflict between these impulses—in the works of such writers as Montaigne, Corneille, Molière, Diderot, Stendhal, Balzac and Zola.

Fall semester, 1972.

12G. The Quest for a Tradition in German Literature. A selection of representative works written in German-speaking countries from the Middle Ages to the end of the nineteenth century. Emphasis on the emergence of characteristically German themes and forms as a response to the influences of historical and cultural forces and of the European literary tradition. Authors will include Gottfried, Grimmshausen, Lessing, Schiller, Goethe, Büchner, Fontane, and Wedekind.

Spring semester, 1973.

12R. Russian Thought and Literature. The development of Russian intellectual traditions as reflected in Russian philosophy and literature from the eighteenth century to the present.

Spring semester, 1972. Mr. Bradley.

12S. Individuality in Spanish Fiction. A study of the struggle of the individual against the traditionalism of his society in Spanish literature from the Renaissance to the twentieth century. Special attention will be given to the figures of the *pícaro*, *la Celestina*, *Don Juan*, *Don Quixote* and *Doña Perfecta*.

Fall semester, 1971.

50F. Intellectual Trends in Twentieth Century French Literature. Principal doctrines (Bergsonism, Surrealism, Marxism, Existentialism, Structuralism) as reflected in, or related to, the major literary or critical works and essays of writers such as Proust, Gide, André Breton, Louis Aragon, Malraux, Sartre, Camus, de Beauvoir, Roland Barthes, Claude Lévi-Strauss, or others.

For fall semester, 1971, the course will focus on:

Man, Freedom, and *Praxis*. Primarily an examination of these concepts as treated in selected literary works or philosophical and political essays by Camus, Sartre, Simone de Beauvoir, Merleau-Ponty or others. Some attention will be given the leading French opponents of Existentialist literary and philosophical or political doctrines.

Mr. Tafoya.

50G. German Literature Since 1900. The reflection in German literature of the political and cultural crises that have dominated the century. Works by Rilke, Thomas Mann, Hesse, Kafka, Musil, Broch, Döblin, Brecht, and contemporary authors.

Spring semester, 1972.

50R. Russian Literature and Revolutionary Thought. A study of continuity and change; 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 the literary revival of the 1960's with emphasis on Herzen, Bakunin, Chernyshevsky, Trotsky, Babel, Olesha, Mayakovsky, Tertz and Solzhenitsyn.

Spring semester, 1973. Mr. Bradley.

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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, Frederico García Lorca, José Camilo Cela, Carmen Laforet and Juan Goytisolo.

Fall semester, 1972. Mrs. Connor.

13. Medieval 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, 1973. Mrs. Perkins.

17. The Age of Enlightenment. The intellectual history of the late seventeenth and eighteenth centuries in Europe as illustrated in selected work exemplifying such important themes as the rise of rationalism and its eventual decline, the opposing forces of optimism and pessimism, and new views of the nature of man and his place in society.

Spring semester, 1972. Mrs. Perkins.

20. The German Novel since 1945. A study of intellectual, literary, and sociological currents in Germany, Austria, and Switzerland since the end of World War II as reflected in representative works of prose fiction. Authors will include Thomas Mann, Hesse, Günter Grass, Max Frisch, and Uwe Johnson.

Fall semester, 1971. Mr. Avery.

34. Renaissance Comparative Literature. See English Literature 34.

48. Modern Drama. See English Literature 48.

31. Chaucer-Dante. See English Literature 31.

EXPLANATORY NOTE ON FIRST AND SECOND-YEAR LANGUAGE COURSES:

a. Courses numbered 1-2, 3 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 and may be followed by an additional semester of courses numbered 3, but does not prepare students for intermediate or advanced courses in literature taught in the original language.

Taught in alternate years according to the following schedule:

1971-72 French 1-2 and German 1-2

1972-73 Russian 1-2 and Spanish 1-2

3 builds upon 1-2 and is designed for students who want further practice in extensive reading. Taught in intervening years according to the schedule listed above but only to satisfy manifest interest. Students wanting to take the courses must indicate their desire to do so before spring registration. Course descriptions will be distributed prior to spring registration.

b. Courses numbered 1B-2B, 3B 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

MODERN LANGUAGES

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) require periodic work in the language laboratory.

French

French may be offered as a major in Course or as a major or minor in Honors. Prerequisites for both Course and Honors students are as follows:

Required: French 6, 11, and 12; the equivalent, or evidence of special competence.

Recommended supporting subject: see the introductory departmental statement.

Majors in Course and Honors, as well as minors in Honors, 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.

COURSES

NOTE: Not all advanced courses are offered every year. Those announced for 1971-72 guarantee adequate coverage for majors but do not preclude additional offerings or special arrangements to satisfy manifest interest. Students wishing to major or minor in French should plan their program in consultation with the department.

1-2, 3. French Reading and Translation. For students who wish to acquire the fundamentals of French grammar and a reading knowledge of the language. This is a terminal sequence. See the explanatory note on language courses above. 1-2 is a year course; offered in 1971-72.

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. Admission contingent upon satisfactory score in the Modern Language Aptitude Test or special permission. See the explanatory note on language courses above. Normally followed by 6, 11 or 12.

6. 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 eighteenth century to the present. Generally taught in both fall and spring semesters.

11. Readings in French Literature. The transition from language learning to literary study is facilitated through intensive readings in modern French literature (works by authors such as Beckett, Butor, Camus, Genet, Gide, Sartre or others). Frequent oral exposés and written compositions as well as extensive readings are assigned to improve fluency and accuracy in French.

Prerequisite: French 3B, the equivalent, or special permission.

Each semester.

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12. Introduction to Literary Studies. An analytical approach to French literature through the study of particular genres or specific modes of expression. The topic for fall semester 1971 is: *La Tradition Comique*. The evolution of French humor as a vehicle for social comment. Selected fictional or dramatic works from various periods.

Prerequisite: French 11, the equivalent, or a score of 650.

Each semester.

13. Freshman Seminar. For freshmen only. Limited enrollment.

Prerequisite: a score of 675 or above in French, and special permission of the instructor. The topic for fall semester, 1971 is: *Littérateurs Engagés*. An examination of ideas of commitment as exemplified in selected literary works and essays by Malraux, Sartre, Camus, de Beauvoir, Merleau-Ponty or others.

Fall semester, 1971. Mr. Tafoya.

14. L'Humanisme de la Renaissance. The evolution of French thought from the optimism of Rabelais to the skepticism of Montaigne as reflected primarily in the prose works of the Renaissance.

Mrs. Smith.

15. Le Théâtre Classique. The development of dramatic techniques in French drama from the sixteenth century through the age of Classicism. Emphasis on Corneille, Racine, and Moliere.

Fall semester, 1971. Mrs. Smith.

16. Le Classicisme. The major writers of the seventeenth century, excluding the dramatists: Descartes, Pascal, La Fontaine, Boileau, La Rochefoucauld, La Bruyere, Mme. de La Fayette.

Mrs. Smith.

17. L'Esprit du 18e Siecle. Development of the critical approach in the works of Montesquieu, Voltaire, Diderot and Rousseau.

Mrs. Perkins.

19. Roman du 19e Siecle. A study of innovations in technique and form as well as the examination of moral problems arising from socio-political changes in 19th century France. Based primarily on the novels of Balzac, Stendhal, Flaubert and Zola.

Fall semester, 1971. Mr. Terdiman.

20. Roman du 20e Siecle. A study of aesthetic innovations and of principal themes in their ideological and sociological context. Readings to be chosen from the works of authors such as Beckett, Breton, Butor, Camus, Céline, Gide, Malraux, Queneau, Robbe-Grillet, Sarraute, Sartre or others.

21. Théâtre Moderne. Major trends in twentieth century drama with special emphasis on the works of Giraudoux, Anouilh, Sartre, Camus, and the Theatre of the Absurd.

Mr. Roza.

22. Littérature du Moyen-Age. The genesis of the French novel in its relation to the epic model and its successor. The function of Love and Adventure in the courtly romance. Emphasis on the *Chanson de Roland*, the romances of Chrétien de Troyes and *La Quete du Graal*.

Mrs. Perkins.

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23. Poésie Symboliste. The evolution of symbolist aesthetics from Baudelaire through Apollinaire. Includes Rimbaud, Mallarmé, Verlaine, LaFougue and Valéry.

Mr. Roza.

25. Poésie Contemporaine. Major poets after Apollinaire: includes the Surrealists (Breton, Reverdy, Eluard, Aragon and Char) as well as Saint-John Perse, Supervielle and representative poets since World War II (Guillevic and Bonnefoy).

28. La France Contemporaine. A study of events and ideas which have shaped French society from the nineteenth century to the present. Selected French works in history, political science, sociology and literature. Emphasis on the evolution of governmental institutions, the changing educational system, the family, and the way the French look at themselves and the rest of the world.

Spring semester, 1972. Mrs. Smith.

30. 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, Sartre, de Beauvoir, Camus or others.

Mr. Tafoya.

40. Littérature et Négritude. This course is designed to provide interested students with an introduction to the works of French-speaking African and West Indian writers. Some emphasis will be placed on the relationship of African authors to the French literary milieu, on the link between their socio-political and aesthetic concerns, and finally on their efforts to adjust themes and forms typical of African vernacular literatures to the tenets of French cultural tradition. The two major figures to be discussed are Léopold Senghor and Aimé Césaire.

50. Colloquium. *Autobiographie: moi public et moi privé.* The various approaches to autobiographical material: confessional, justificatory, exploratory, exemplary, and introspective. Works will include St. Augustine, Montaigne, Rousseau, Chateaubriand, Stendhal, Gide, de Beauvoir and Sartre. Emphasis will be laid on the play between the individual's public and private life and his view of these two spheres. This colloquium will be offered in English. Students who wish to include it in their French program may do so by doing the reading and writing in French. Separate discussion groups will be organized if there is sufficient student interest.

Fall semester, 1971. Mrs. Perkins.

52. Special Topics (for senior majors). Study of individual authors, selected themes or critical problems.

Spring semester, 1972.

53. Thesis.

54. Directed Reading.

HONORS SEMINARS

100. Littérature du Moyen-Age. Old French readings in lyric poetry, theatre and romance.

Mrs. Perkins.

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101. La Renaissance. Prose works of Rabelais, Marguerite de Navarre, and Montaigne. Poetic innovations from Marot through the Pléiade.

Mrs. Smith.

102. Le Théâtre Classique. Corneille, Racine, Moliere.

Mrs. Smith.

103. L'Age des Lumieres. Concentrating on Diderot and Rousseau.

Mrs. Perkins.

104. Stendhal et Flaubert.

Mr. Roza.

105. Proust.

Mr. Terdiman.

106. Poésie Moderne. Baudelaire, Rimbaud, Verlaine, Mallarmé, Claudel, Valéry.

Fall semester, 1971. Mr. Roza.

108. Le Roman du 20e Siecle.

Mr. Roza.

110. Special Topics. Study of individual authors, selected themes or critical problems not included in the regular program to satisfy the interest of students and instructors.

Each semester.

112. Thesis.

NOTE: Some seminars treat the same subjects as the courses, but the reading required in both texts and critical material is more extensive. The work of a seminar corresponds to two courses.

German

German may be offered as a major in Course or as a major or minor in Honors. Prerequisites for both Course and Honors students are as follows:

Required: German 11 or 12, or equivalent work.

Recommended supporting subjects: see the introductory departmental statement.

Majors are expected to speak German with sufficient fluency to take part in discussion in courses and seminars in the language and to pass oral examinations in German.

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.

COURSES

1-2, 3. German Reading and Translation. For students who wish to acquire the fundamentals of German grammar and a reading knowledge of the language. This is a terminal sequence. See the explanatory note on language courses above. 1-2 is a year course; offered in 1971-72.

MODERN LANGUAGES

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. Admission contingent upon satisfactory score in the Modern Language Aptitude Test or special permission. See the explanatory note on language courses above. Normally followed by 6, 11 or 12.

4. Intermediate German. For entering students with high school language training and for whom the "B" sequences or German 6 would not be appropriate. Review of grammar, literary readings of moderately difficult texts, such as Hesse's *Knulp*, Brecht's *Kalendergeschichten*, Dürrenmatt's *Der Besuch der alten Dame*, and Kafka's *Der Landarzt*; poems and examples of expository prose. Normally followed by German 6 or 11 in spring semester. Admission contingent upon departmental testing or permission of the instructor.
Fall semester, 1971. Mr. Mautner.

6. 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.
Prerequisite: German 3B or 4; the equivalent, or permission of the instructor.
Fall semester, 1971. Miss Cohn.

11. Introduction to German Literature (19th and early 20th centuries). A study of representative prose fiction, poetry, and drama from the German Romantics to Kafka. Discussion, papers. Not a survey course.
Prerequisite: German 3B or 4; the equivalent, or permission of the instructor.

12. Introduction to German Literature (Goethe and his Age). A study of works by Lessing, Goethe, and Schiller. Discussion, papers. Not a survey course.
Prerequisite: German 3B or 4; the equivalent, or permission of the instructor.

14. Goethes Faust, Erster und Zweiter Teil. An intensive study of *Faust, I and II*. Also for students who only know *Faust, Part One*.
Spring semester, 1972. Mr. Mautner.

15. Die Deutsche Romantik. Also taught as a seminar. See German 105 below.
Mr. Avery.

16. Die Deutsche Novelle seit Goethe. Also taught as a seminar. See German 110 below.
Miss Cohn.

17. Moderne Deutsche Literatur. A study of leading German writers of the twentieth century, including Hauptmann, Thomas Mann, Rilke, Hofmannsthal, Kafka.
Miss Cohn.

18. Studies in German Poetry. Also taught as a seminar. See German 111 below.
Mr. Mautner.

20. Die Deutsche Komödie. Also taught as a seminar. See German 109 below.
Mr. Mautner.

MODERN LANGUAGES

21. Kafka und Brecht. A study of the principal works of each author with stress on the interpretation of major themes and the examination of literary craftsmanship. Includes consideration of the cultural and social environment in which the works were written.

Mr. Avery.

30. Herman Hesse. A study of the central themes and the development of narrative technique in Hesse's novels. Works to be examined will include: *Knulp*, *Demian*, *Siddhartha*, *Der Steppenwolf*, and *Die Morgenlandfahrt*. Prerequisite: German 11 or 12. Meets 1½ class hours per week. Offered by special arrangement. *Half-course*.

Mr. Avery.

50-51. Colloquium. Offered from time to time in response to student and faculty interests. Devoted to an intensive examination of subjects or topics not covered in the regular program. Enrollment is limited and subject to departmental approval.

52. Special Topics (For senior majors). Study of individual authors, selected themes or critical problems.

HONORS SEMINARS

103. Deutsches Barock und Aufklärung. A study of German literature in the seventeenth and early eighteenth centuries. The lyric poetry of the period, the mysticism of Angelus Silesius and Jakob Böhme, the plays of Gryphius, and the prose of Grimmelshausen; a study of Lessing.

104. Goethe. Goethe's most significant works and his role in German intellectual history will be studied.

Fall semester, 1971. Mr. Mautner.

105. Die Deutsche Romantik. Romanticism as the dominant movement in German literature, thinking, and the arts of the first third of the nineteenth century. Authors: Hölderlin, Novalis, Tieck, Büchner, Brentano, Eichendorff.

Spring semester, 1972. Mr. Avery.

107. Moderne Prosa. The development of German prose fiction since 1900 as reflected in works by Schnitzler, Hofmannsthal, Rilke, Mann, Kafka, Döblin and Grass.

Mr. Avery.

108. Das Deutsche Drama. Representative examples of the dramatic genre in German literature from the end of the eighteenth century to the present.

109. Die Deutsche Komödie. Outstanding comedies from Goethe to the present time will be studied in their own right, as examples of the genre, and as illustrations of German intellectual history.

110. Die Deutsche Novelle. A study of significant examples of this typically German genre. Authors: Goethe, Eichendorff, Kleist, Stifter, Keller, Thomas Mann, and contemporary writers.

Miss Cohn.

111. Studies in German Poetry. A study of selected examples of German poetry from the Baroque period to the present time. The interrelation of *Aussage*, *Gehalt* und *Gestalt*.

MODERN LANGUAGES

112. Modernes Drama und Lyrik des XX. Jahrhunderts. The emergence of modern trends as reflected primarily in the poetic and dramatic works of Hauptmann, George, Hofmannsthal, Rilke, Trakl, Sternheim, Benn and Brecht. Miss Cohn.

Russian

Russian may be offered as a major in Course or as a major or minor in Honors. Prerequisites for both Course and Honors students are as follows:

Required: Russian 11, 12 and 13, or evidence of equivalent work.

Recommended supporting subjects: see the introductory departmental statement.

COURSES

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.

1-2, 3. Russian Reading and Translation. For students who wish to acquire the fundamentals of Russian grammar and a reading knowledge of the language. The first year will be devoted primarily to grammar and the third semester to reading and translation. (Refer to the explanatory note on language courses above).

Not offered in 1971-72.

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. Admission contingent upon satisfactory score in the Modern Language Aptitude Test or special permission. See the explanatory note on language courses above. Normally followed by 6 and 12.

5, 6. Advanced Russian. For majors and those primarily interested in perfecting their command of language. Advanced conversation, composition, translation and stylistics. Readings of dramas and newspapers. Conducted in Russian.

11. Introduction to Literature. A survey of Russian literature from eighteenth century Classicism through the Romantic period to the emergence of Russian Realism. Emphasis on Pushkin, Lermontov, Gogol, Turgenev, Dostoevsky, and Tolstoy. Readings and class discussions in Russian.

12. Introduction to Literature. A survey of Russian prose and poetry from the later nineteenth century through the post-revolutionary period. Consideration of representative works and new literary movements. Writings of Garshin, Chekhov, Blok, Zamyatin, Babel, Pasternak, Akhmatova, and Solzhenitsyn will be read and discussed in Russian.

13. Russian Novel. Lectures and reading in English. The Russian majors will be required to read a part of the material in Russian.

14. Poetry and Poetics. A study of the major literary theories and movements from the late nineteenth century through the post-revolutionary period with emphasis on Symbolism, Russian Formalism, and Futurism. Readings in Russian. Lectures and discussion in English.

52. Special Topics. (For senior majors). Study of individual authors, selected themes or critical problems.

MODERN LANGUAGES

HONORS SEMINARS

101. Tolstoy.
102. Russian Short Story.
103. Pushkin and Lermontov.
104. Dostoevsky.
105. Literature of the Soviet Period.
107. Russian Lyrical Poetry.
108. Modern Russian Poetry.

Spanish

Spanish may be offered as a major in Course or as a major or minor in Honors. Prerequisites for both Course and Honors students are as follows:

Required: Spanish 11 and 12, 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 courses and seminars in the language and to pass all oral comprehensive or oral Honors examinations in Spanish.

NOTE: Not all advanced courses are offered every year. Those announced for 1971-72 and 1972-73, guarantee adequate coverage for majors but do not preclude additional offerings or special arrangements to satisfy manifest interest. Students wishing to major or minor in Spanish should plan their program in consultation with the department.

COURSES

1-2, 3. Spanish Reading and Translation. For students who wish to acquire the fundamentals of Spanish grammar and a reading knowledge of the language. This is a terminal sequence. See the explanatory note on language courses above. Not offered in 1971-72.

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. Admission contingent upon satisfactory score in the Modern Language Aptitude Test or special permission. See the explanatory note on language courses above. Normally followed by 6, 11 or 12.

5. 6. Composition and Diction. For majors and others who wish advanced courses in which the emphasis is not primarily literary. An effort is made to correct faulty pronunciation and to improve self-expression in the language both oral and written.

11. Introduction to Spanish Literature. A study of representative prose fiction, poetry and drama of the nineteenth and twentieth centuries (works by authors such as Espronceda, Zorrilla, Bécquer, Pérez Galdós, Unamuno, Baroja, Lorca, etc.). Discussion, papers.

Prerequisite: Spanish 3B, the equivalent, or special permission.

MODERN LANGUAGES

12. Introduction to Spanish Literature. A study of representative prose fiction, poetry and drama from the later Middle Ages through the Golden Century (authors to be read include: Jorge Manrique, *Romances*, Cervantes, Lope de Vega, Calderón, Quevedo, etc.) Discussion, papers.
Prerequisite: Spanish 3B, the equivalent, or special permission.

NOTE: Spanish 11 and 12, the equivalent, or consent of instructor, are prerequisite for the courses in literature that follow.

20. La Literatura Medieval. From the *Poema del Cid* to *La Celestina*. Also included are works by Gonzalo de Berceo, Don Juan Manuel, el Arcipreste de Hita, and Jorge Manrique.

Fall semester, 1972.

21. El Teatro del Renacimiento y del Siglo de Oro. Special emphasis will be placed on the outstanding dramatists of the Golden Century (Lope de Vega, Tirso de Molina, Ruiz de Alarcón, Calderón, etc.).

Spring semester, 1972. Mrs. Asensio.

23. La Poesía del Renacimiento y del Siglo de Oro. From the *Romancero* through the Baroque. Special emphasis on Garcilaso de la Vega, Herrera, Fray Luis de León, San Juan de la Cruz, Lope de Vega, Quevedo and Góngora.

Spring semester, 1973.

24. Cervantes. The works of Cervantes with special emphasis on the *Quijote*.

Fall semester, 1971. Mrs. Asensio.

26. La Novela en el Siglo XIX. Realism and Naturalism in nineteenth century prose fiction. Works by Alarcón, Valera, Pérez Galdós, Pardo Bazán, Clarín, Blasco Ibáñez and others.

27. La Generación del 98. Studies in the works of Valle-Inclán, Azorín, Baroja, Unamuno, Benavente and Antonio Machado.

Fall semester, 1972.

28. Literatura Española Contemporánea. Major figures of the twentieth century not covered in Spanish 27: Juan Ramón Jiménez, García Lorca, Alberti, Salinas, Guillén, Hernández, Hierro and Aleixandre among the poets; novels by Cela and Goytisolo; the theater of Casona and Sastre.

Spring semester, 1973.

29. Literatura Hispanoamericana. The nineteenth-century realistic novel, modernism and the post-modernist novel. Representative works of authors such as Rubén Darío, Silva, Rodó, Lugones, Chocano, Rivera, Gallegos, Azuela, or others.

Spring semester, 1972. Miss Grasso.

30. La Poesía Hispanoamericana en el Siglo XX. A study of the poetry of Mistral, Agustini, Ibarbourou, Storni, Vallejo, Huidobro, Gorostiza, Paz, Nicolás Guillén, Neruda, Borges, and others.

31. La Novela Hispanoamericana en el Siglo XX. Works by Mallea, Sábato, Cortázar, Carpentier, Asturias, Rojas, Vargas Llosa, Rulfo, Fuentes, García Márquez or others.

Fall semester, 1971. Miss Grasso.

MODERN LANGUAGES

50-51. Colloquium. Offered for double credit and devoted to the intensive investigation of subjects or topics not covered by the regular program. Enrollment is limited and subject to departmental approval.

52. Special Topics (for senior majors). Study of individual authors, selected themes or critical problems.

HONORS SEMINARS

108. Las Obras de Cervantes.

109. La Generación del 98: Valle-Inclán, Azorín, Baroja, Unamuno, Maeztu, Benavente, Antonio Machado.

110. Literatura Española Contemporánea.

111. La Poesía Hispanoamericana en el Siglo XX.

112. La Novela Hispanoamericana en el Siglo XX.

113. La Teatro del Renacimiento y del Siglo de Oro.

114. La Poesía del Renacimiento y del Siglo de Oro.

NOTE: Some seminars treat the same subject as the courses, but reading required in both texts and critical material is more extensive. The work of a seminar corresponds to that of two courses.

MUSIC

PETER GRAM SWING, *Professor and Chairman*

JAMES D. FREEMAN, *Assistant Professor*

DAVID H. STEINBROOK, *Instructor*

JANE STRONG O'LEARY, *Lecturer*

GILBERT KALISH, *Associate in Performance*

ROBERT M. SMART, *Associate in Performance*

PAUL ZUKOFSKY, *Associate in Performance*

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 and seminars train the student to work with musical material, to understand modes of organization in composition and to evolve methods of musical analysis. History courses and seminars 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 orchestra, chorus and chamber music coaching program which it staffs and administers. Scholarships are available to assist music majors who are talented instrumentalists or singers finance the cost of private instruction.

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 pre-

MUSIC

requisite for acceptance as a major. Majors will normally take six semester courses in theory (including Music 61-62), four semester courses in history (including Music 15, 16), and meet the basic piano requirement.

Major in Honors: A student intending to major in Honors will generally stand for four papers in music. The department strongly recommends that one paper be a thesis or research project. Music 61-62, required of all majors, may be used as the basis of a paper. Papers in history can be prepared by tutorial, by seminar or by taking a history course with a concurrent or subsequent attached unit of additional research.

Minors in Honors: A student intending to minor in Honors will generally stand for two papers in music. Two semester courses in theory and one semester course in history are prerequisite for a minor. Music 1 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 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 39 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.

CREDIT FOR PERFORMANCE

A student who has taken Music 1, Music 11-12, or Music 13-14 (or who has equivalent prior training) has the option to receive credit for study of an instrument or voice, participation in the department's chamber music coaching program, participation in the Swarthmore College Orchestra, and participation in the Swarthmore College Chorus. The amount of credit received will normally be a half-course in any one semester, and will usually be granted only to students participating for a full year in a particular activity. Students applying for credit will be given an audition at the beginning of the semester and 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.

A student applying for credit for study of an instrument or voice will first demonstrate to the department his ability to undertake such study at least at an intermediate level. He will arrange to work with a teacher of his choice, subject to approval of the department. The department will then supervise the course of study in any semester for which credit is to be given. The teacher will submit a written report of the student's work at the close of the semester to be used by the department in making its evaluation. The department may use public performance or a final audition as additional evidence for evaluating work. The College does not undertake to pay for instruction; the student is expected to make his own financial arrangements directly with the teacher.

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COURSES AND SEMINARS

NOTE: All seminars are open to qualified Course students.

1. Introduction to Music. A course combining study of the materials of music (including fundamentals) with training in listening and analysis. Students will work with a selected repertory of compositions from different eras. The course assumes no prior training in music.

Open to all students without prerequisite.

Fall semester. Mr. Freeman.

Spring semester. Mr. Swing.

Theory and Composition

11-12. First Year Theory. A course in elementary tonal theory offering basic training in harmony and counterpoint. Emphasis will be placed on written exercises along with ear-training, dictation and keyboard harmony. Frequent reference will be made to a variety of keyboard and chamber compositions which will be carefully analyzed.

Year course. Miss Strong.

13-14. Second Year Theory. A continuation of Music 11-12.

Year course. Mr. Steinbrook.

61-62. Third Year Theory. A continuation of Music 13-14 covering specialized areas of harmony, counterpoint and analysis.

Year course. Mr. Steinbrook.

63-64. Advanced Theory.

Year course. Mr. Steinbrook.

History of Music

15. Introduction to the History of Music (I). Topics in music of the Middle Ages and the Renaissance, with emphasis given to the analysis and performance of selected compositions. This course is concerned with studying the relationship of music to the art and thought of the times, and the function of music in the Roman Catholic liturgy.

Prerequisite: Music 1 (or the equivalent).

Fall semester. Mr. Swing.

16. Introduction to the History of Music (II). Topics in music of the 17th, 18th and 19th centuries. In 1971-72 the course will be concerned with a study of orchestral music and with the development, expansion, and eventual decay of the orchestra as a primary compositional medium.

Spring semester. Mr. Freeman.

22. Contemporary Music. An examination of a selected group of compositions. Rather than attempt a survey based on stylistic considerations, or an aesthetic evaluation, the course will deal with the analysis of individual solutions to common compositional problems.

Spring semester. Mr. Steinbrook.

27. J. S. Bach. A study of representative compositions (including the *Mass in B minor* and the *Passion according to St. Matthew*) coordinated with readings

MUSIC

in primary and secondary sources. A reading knowledge of German is desirable, but not essential.

Open to students with permission of the instructor.

Not offered in 1971-72. Mr. Swing.

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 (whenever possible) performance of selected works.

Open to students with permission of the instructor.

Not offered in 1971-72. Mr. Swing.

40. Analysis, Research, Performance. An examination of the relevances of analytical and historical research to intelligent performance through study of selected compositions. Ability to perform instrumentally or vocally is required, though it need not have reached an exceptionally skilled level.

Fall semester. Mr. Freeman.

42. 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 required.

Spring semester. Mr. Freeman.

70. Senior Reading and Research.

Staff.

71-72. Senior Thesis.

Fall and spring semesters. Staff.

91. Tutorial. Special work in composition, theory, or history.

Staff.

HONORS SEMINARS

101. The Sixteenth Century Parody Mass. An investigation of parody as a concept and as a technique of composition, giving particular attention to Masses by different composers on the same model.

Spring semester. Mr. Swing.

103. Early Nineteenth Century Romanticism. A study of the origins and rationale of musical Romanticism in the first half of the nineteenth century. A reading knowledge of French or German will be very helpful.

Not offered in 1971-72. Mr. Freeman.

171. Senior Thesis.

Fall and spring semesters. Staff.

191. Tutorial.

Staff.

PERFORMANCE

NOTE: All performance courses are for half-course credit per semester. See p. 62 and p. 159 for general provisions governing work in performance under the provisions for Creative Arts.

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34. Performance (chamber music).

Both semesters. Mr. Kalish, Mr. Zukofsky and staff.

35. Performance (orchestra).

Both semesters. Mr. Freeman.

36. Performance (chorus).

Both semesters. Mr. Swing.

37. Individual Instruction.

Both semesters.

39. Figured Bass and Score Reading.

Both semesters. Mr. Smart.

PHILOSOPHY

JOHN M. MOORE, *Professor*

DANIEL BENNETT, *Associate Professor*

HUGH L. LACEY, *Associate Professor***

HANS OBERDIEK, *Associate Professor*

CHARLES RAFF, *Assistant Professor and Acting Chairman*

RICHARD SCHULDENFREI, *Assistant Professor*

RICHARD SHARVY, *Assistant Professor*

UWE HENKE, *Instructor‡*

RICHARD J. BERNSTEIN, *Visiting Lecturer***

GILMORE STOTT, *Lecturer*

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 Course are required to write a senior thesis.

1. Introduction to Philosophy. Methods of philosophical investigation are introduced through discussion of typical philosophical problems, such as: the problem of freedom, the arguments for the existence of God, the nature of logic and mathematics, the sources and limits of human knowledge, the justification of moral judgments. Readings include classical and current sources. Introduction to Philosophy is a prerequisite for all other philosophy courses except Logic.

Each semester. The staff.

1A. Freshman Seminar in Moral Philosophy. A seminar open only to freshmen, an alternative to Philosophy 1. Enrollment limited to eight students, chosen by lot from those interested.

Fall semester. Mr. Stott.

10. The Nature and Methods of Inquiry. From the perspectives of their

‡Absent on leave, 1971-72.

**Spring semester, 1971-72.

PHILOSOPHY

fields the instructors in this course will explain and critically examine the methodological foundations of the various disciplines they represent. At the same time an attempt will be made to compare and relate methodology and substantive problems of different disciplines with the goal of arriving at a coherent view of scientific inquiry. The emphasis given to different disciplines will vary depending on the composition of the staff.

Not offered in 1971-72. Interdepartmental staff.

11. Ethics. A study of the principal theories about value and moral obligation, and of their justification. The emphasis is systematic, but works of leading ethical philosophers, both classical and contemporary, will be read as illustrations of the major theories.

Each semester. Mr. Oberdiek or Mr. Stott.

12. Logic. An introduction to the principles of deductive logic with equal emphasis on the syntactic and semantic aspects of logical systems. Topics include the notions of logical truth, logical consequence, and proof. Some attention is given to the development of axiomatic theories and selected topics in the philosophy of logic.

Fall semester. Mr. Sharvy.

13. Selected Modern Philosophers. A history of modern philosophy is presented through the metaphysical and epistemological problems common to Descartes, Leibniz, Spinoza, Locke, Berkeley, Hume and Kant. One or more of these philosophers may be selected for separate and detailed examination. As the content varies from year to year, the department may permit students to take this course twice. This year the course will concentrate on Berkeley and Leibniz.

Spring semester. Mr. Sharvy.

14. Ancient Philosophy. The analysis of selected topics in Plato and Aristotle. Primary attention is given to problems in epistemology, metaphysics, and the philosophy of logic.

Spring semester. Not offered in 1971-72. Mr. Sharvy.

16. Philosophy of Religion. The nature of religion; the psychology and interpretation of religious experience; the problem of religious knowledge; the validity and difficulties of Christian theology and ethics. (Also listed as Religion 16.)

Fall semester. Mr. Bennett.

17. Aesthetics. An examination of problems like representation, meaning, structure, form and content, piece and performance, and abstraction as they arise in describing, perceiving, interpreting and constructing works of art. Readings from Aristotle, Kant, Husserl, Goodman, Boretz, and others.

Fall semester. Mr. Sharvy.

18. Philosophy of the Social Sciences. Philosophical problems that arise in the application of scientific methods to human behavior; i.e., problems concerning concepts, laws, theories, values, explanation and prediction in the social sciences and history; and the differences and similarities between social and natural science.

Fall semester. Not offered in 1971-72.

19. Medieval Philosophy. See Religion 19.

Fall semester. Not offered in 1971-72. Mr. Urban.

PHILOSOPHY

- 20. Existentialism and Religious Belief.** See Religion 20.
Spring semester. Mr. Urban.
- 21. Social and Political Philosophy.** An analysis of conceptual and moral problems that socio-political life poses for many.
Not offered in 1971-72.
- 22. American Philosophy.** A critical examination of selected major American philosophers, such as Peirce, James, Dewey, Quine, and Goodman, and their contributions to such philosophical traditions as Pragmatism and Positivism. This year the course will focus on the response to Positivism by Quine and Goodman, with an emphasis on analyzing their metaphysical and epistemological positions.
Fall semester. Mr. Schuldenfrei.
- 23. Contemporary Philosophy.** A study of current attempts to resolve fundamental philosophical issues. Readings include articles and books by major 20th century philosophers, such as G. E. Moore, Bertrand Russell, and Ludwig Wittgenstein.
Fall semester. Mr. Raff.
- 24. Epistemology.** The analysis of some problems about knowledge and belief, such as: the justification of beliefs and its connections to the justification of actions, the definition of knowledge, the possibility of *a priori* knowledge, the nature of perception, an assessment of rationalism, pragmatism, and empiricism. Readings from both classical and current sources.
Spring semester. Mr. Schuldenfrei
- 25. Advanced Logic.** Topics selected from the areas of deductive logic, inductive logic, the logic of decision and choice, modal and tense logic, model theory, algebraic logic, etc.
Spring semester, alternate years. Not offered 1971-72.
- 26. Philosophy of Language.** Topics include the objectivity of meaning, the determinacy of translation, language and ontology, logical grammar, the nature of propositions, category mistakes, the notion of grammaticality, and some philosophical implications of recent work in linguistics. Readings from Aristotle, Augustine, William of Sherwood, Frege, Russell, Geach, Quine, and Chomsky.
Philosophy 12 or Linguistics 1 recommended.
Spring semester. Mr. Sharvy.
- 27. Metaphysics.** This course will examine such topics as Universal and Particular, Abstract and Concrete, Essence and Accident, Physical Object and Event, Space, Time and Causation.
Philosophy 12 recommended.
Spring semester. Mr. Bennett.
- 28. Marxist Philosophy.** An introduction to the philosophy of Marx, Engels and Lenin. Based on the major writings of these philosophers, the course will begin with a systematic exposition of the fundamental concepts of Marxist social, economic and political theory. Then, in keeping with Marx's conception of the intimate connection between social analysis and social philosophy, an attempt will be made to deepen the understanding of certain theoretical concepts (alienation, consciousness, etc.) by applying them in the analysis of selected contemporary social problems.
Fall semester. Not offered in 1971-72. Mr. Henke.

PHILOSOPHY

29. Philosophy of Mind. Concepts of mind will be explored with special attention given to the mind-body problem and the nature of motive, intention, and human action. Readings from both historical and contemporary sources.

Fall semester. Not offered in 1971-72. Mr. Oberdiek.

30. The Philosophy of Education. The idea of education in philosophy, and the implications of philosophical and psychological theories for educational practice. Readings may include: Plato, Rousseau, Kant, Tolstoy, Dewey, James, Whitehead, Montessori, Skinner, Piaget, Neill, Laing, and McLuhan.

Not offered in 1971-72.

31. Religion and Ethics. The perennial problems of ethics and their relationship to religious perspectives. Attention will be given to the analysis of moral and religious discourse. Both classical and contemporary authors will be examined.

Prerequisite: Philosophy 1 or Religion course numbered 3 through 6, or the consent of the instructors. (Also listed as Religion 31.)

Fall semester. Mr. Oberdiek and Mr. Urban.

34. 19th Century Philosophy. Topics or systems are selected for intensive treatment from Continental, British or American Philosophy; this year: the philosophy of Hegel.

Spring semester. Mr. Bernstein.

37. History of Science. A survey of the development of physics and astronomy in the sixteenth and seventeenth centuries, emphasizing the nature of the scientific revolution, the revolt against Aristotle, the new role of mathematics within science, the role of experiment, and the gradual development of concepts of mass, force, universal gravitation, and the heliocentric universe. The philosophical and sociological origins of the scientific revolution will also be studied. Readings are drawn mainly from the writings of Copernicus, Kepler, Galileo, Descartes, and Newton.

Spring semester. Mr. Lacey.

38. Philosophy of Science. The focus of the course is on recent systematic attempts to solve certain major and related problems concerning science. Among these problems are distinguishing scientific from non-scientific bases for the acceptance or rejection of claims, determining the proper field for scientific inquiry, and determining the foundation of scientific knowledge.

Spring semester. Not offered in 1971-72. Mr. Lacey.

50. Directed Reading.

Each semester. The staff.

51. Thesis. Required for majors in Course.

Fall semester. The staff.

60-61. Colloquium: Legal and Political Philosophy. 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 justifications of punishment are considered. Readings in both historical and contemporary sources.

Not offered in 1971-72. Mr. Oberdiek.

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63-64. Colloquium: Philosophy of the Social Sciences. This colloquium will concentrate on philosophical anthropology. It will consider some different conceptions of man which have been important historically or are of contemporary relevance, such as those of B. F. Skinner, Freud, Dewey, Durkheim, and Marx. The different conceptions will be examined with special emphasis on their implications for social organization and the nature and possibility of human happiness.

Fall semester. Mr. Schuldenfrei.

HONORS SEMINARS

101. Moral Philosophy. An examination of the principal theories about value and moral obligation, and of their justification; of the concepts of justice and human rights; of the implications for ethics of different theories about the freedom of the will. Works of representative theorists, both classical and contemporary, will be read.

Spring semester. Mr. Oberdiek.

102. Ancient Philosophy. The development of Greek thought in ethics, metaphysics, logic and science, with special attention to Plato and Aristotle. Emphasis is given to tracing the emergence of distinctively philosophical and scientific methods, and the relation of these methods to contemporary techniques.

Spring semester. Mr. Bennett.

103. Modern Philosophy. Metaphysical and epistemological problems about the nature of minds and bodies, the varieties of knowledge and freedom, are approached through the philosophical systems of Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume, Reid, Kant.

Spring semester. Mr. Raff.

104. Contemporary Philosophy. Some current philosophical problems are investigated in light of the work of Bradley, Moore, Wittgenstein, and the most recent contributions.

Fall semester. Mr. Raff.

105. Philosophy of Science. A consideration of the nature of scientific inquiry through a study of its fundamental concepts, among them theory, evidence, explanation, causation, induction. Emphasis will also be given to the distinctions between empirical and non-empirical science and between scientific and non-scientific inquiry.

Fall semester. Not offered in 1971-72. Mr. Lacey.

106. Aesthetics. A systematic examination of the philosophy of art. (See Course 17).

Fall semester.

107. Logic. This seminar will examine selected topics in technical logic which are of philosophic importance, such as predicate logics with identity, modal logic, tense logic, algebraic logic, and formal properties of deductive systems, e.g., consistency, decidability, and completeness. Some non-standard logics may be studied and compared.

Spring semester. Mr. Lacey.

108. Foundations and Philosophy of Mathematics. This seminar will aim at developing the major results in selected areas in metamathematics and the foundations of mathematics. Topics may include the development of Godel's incompleteness theorem, recursive function theory, axiomatic set theory, non-

PHILOSOPHY

standard analysis, and the consistency and independence of the axiom of choice and of the continuum hypothesis.

Not offered in 1971-72. Mr. Henke.

109. Metaphysics. The logical analysis of problems and theories about time, change, form, matter, essence, substance, identity and universals. Readings from such philosophers as Aristotle, Leibniz, McTaggart, Russell and Quine.

Fall semester. Not offered in 1971-72. Mr. Sharvy.

110. Medieval Philosophy. See Religion 110.

Fall semester. Not offered in 1971-72. Mr. Urban.

111. Philosophy of Religion. Current techniques of philosophical analysis are brought to bear on the philosophical issues raised by religious belief and experience.

Fall semester. Mr. Bennett.

112. Philosophy of Mind. Concepts of mind will be explored with special attention given to the mind-body problem and the nature of human action. Readings from both historical and contemporary sources.

Fall semester. Not offered in 1971-72. Mr. Oberdiek

113. Epistemology. The seminar will concern itself primarily with the problem of the sources of knowledge and the problem of justifying belief.

Fall semester.

114. Hegel.

Mr. Bennett.

115. Language and Thought. See Linguistics 107.

117. Philosophy of the Social Sciences. Philosophical problems that arise in the application of scientific methods to human behavior (see Course 18). The discussion will focus on the nature of human action.

Spring semester.

120. 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 FOR MEN

WILLIS J. STETSON, *Professor of Physical Education
for Men and Director of Athletics*

GOMER DAVIES, *Associate Professor*

LEWIS H. ELVERSON, *Associate Professor*

ERNEST J. PRUDENTE, *Associate Professor*

WILLIAM C. B. CULLEN, *Assistant Professor*

DOUGLAS M. WEISS, *Instructor*

BROOKE P. COTTMAN, *Assistant*

HENRY C. FORD, *Assistant*

JACK HOUTZ, *Assistant*

JOSEPH LEITNER, *Assistant*

JAMES J. McADOO, *Assistant*

ROBERT McCOACH, *Assistant*

C. J. STEFANOWICZ, *Assistant*

EDGAR TOWNSLEY, *Assistant*

JOHN P. UDOVICH, *Assistant*

ANDREW J. ZACHORCHEMNY, *Assistant*

DR. MORRIS A. BOWIE, *College Physician*

DR. HAROLD C. ROXBY, *Team Physician*

The course in Men's Physical Education is designed to promote an awareness of one's physical well being through a regular exercise program. In addition the learning of new sports skills and the improvement of previously learned ones is achieved by planned instructional opportunities. Emphasis is placed on the individual, or so-called "carry-over" sports, as well as those involving a team effort.

The intercollegiate athletic program is a comprehensive one with varsity schedules in eleven different sports. In many of these activities there are contests arranged for junior varsity teams, thus providing ample opportunity for large numbers of men to engage in intercollegiate competition.

FACULTY REQUIREMENTS

Physical Education is required of all non-veteran freshmen and sophomores unless excused by the College physician. By meeting certain minimum objectives, one may be exempted from the program after satisfactorily completing one year's work. During participation in the program men students must participate in their assigned activity a minimum of three hours per week.

All men not excused for medical or other reasons are expected to fulfill this requirement. A semester's work failed in the first two years must be repeated in the Junior year. No man with a deficiency in physical education is permitted to enter his Senior year.

*Intercollegiate competition only.

**Intercollegiate competition and course instruction.

†Some co-ed sections.

PHYSICAL EDUCATION FOR MEN

FALL ACTIVITIES

Adapted Physical Education	*Cross Country	†Modern Dance
†Aquatics	†Folk Dance	**Soccer
†Archery	*Football	†Tennis
Badminton	†Golf	Touch Football

WINTER I AND II ACTIVITIES

Adapted Physical Education	†Folk Dance	†Tennis
†Aquatics	†Modern Dance	†Volleyball
†Badminton	Squash	Weight Training
**Basketball	*Swimming	*Wrestling

SPRING ACTIVITIES

Adapted Physical Education	*Lacrosse	*Track
†Aquatics	†Modern Dance	†Volleyball
*Baseball	Softball	
**†Golf	**†Tennis	

*Intercollegiate competition only.

**Intercollegiate competition and course instruction.

†Some co-ed sections.

PHYSICAL EDUCATION FOR WOMEN

ELEANOR K. HESS, *Chairman and Associate Professor*

IRENE MOLL, *Associate Professor**

MARY ANN YOUNG, *Assistant Professor*

PATRICIA BOYER, *Lecturer*

JANICE FELLMAN, *Lecturer*

DR. MORRIS A. BOWIE, *College Physician*

The aim of the Department is to contribute to the education of all women students through the medium of physical activity. We believe this contribution can best be achieved through participation in a broad program of sports, dance and developmental activities. The program provides instruction and experience in sports and dancing, and swimming instruction on all levels. It is our hope that the student will also acquire: appreciation of the dance as an art form; good sportmanship; added endurance; good posture; leadership training; joy in outdoor exercise; and a program of interests and skills that will carry over for her after college, so she may become a useful part of her community.

An attempt is made to keep classes small in order to insure individual attention, and students are grouped where possible according to ability. Ample opportunities are given for intramural and intercollegiate competition, as well as for public performances and demonstrations.

Freshmen and sophomores take three periods of activity each week. These may be elected from classes listed below with the stipulation that they take swimming for a maximum of one semester (at least 36 water hours) if they fail to

*Absent on leave, fall semester, 1971-72.

PHYSICAL EDUCATION FOR WOMEN

pass the beginning swimming test. In the sophomore year, the department encourages the students to develop greater initiative in acquiring habits of regular exercise by planning their own programs of physical activity. This is accomplished by granting greater freedom in the fulfillment of the requirement through a variety of programs worked out by the student and the department. After the freshman year, a student may be exempted out of the required program if she has successfully passed the physical fitness test, the swimming test and two practical and written tests in activities chosen from the areas of individual sports, team sports and dance.

In addition to the departmental requirements, the faculty regulations state the following: "If any semester's work of the first two years is failed, it shall be repeated in the junior year. No student shall be permitted to enter her senior year with a deficiency in physical education."

Each student is expected to wear clothing appropriate for the activities which she elects to pursue. These can either be ordered through the College or brought from home. Blanks for those who wish to order gym uniforms will be sent out from the office of the Dean to all incoming freshmen.

ACTIVITIES

Archery.*

Fall and Spring. Class and Varsity.

Badminton.

Winter. Class and Varsity.

Basketball.

Winter. Class and Varsity.

Bowling.

Winter. Class.

Conditioning Exercises.

Fall, Winter and Spring.

Fencing.

Winter.

Folk and Square Dancing*

Fall, Winter and Spring. Class and Performance Group.

Golf.*

Fall and Spring. Class.

Hockey.

Fall. Class and Varsity.

Jogging.

Winter.

Lacrosse.

Spring. Class and Varsity.

Modern Dance.*

Fall, Winter and Spring. Class and Performance Group. Dance Composition.

PHYSICAL EDUCATION FOR WOMEN

Self-Defense.

Winter.

Soccer.

Winter. Class.

Softball.

Spring. Class and Varsity.

Squash.

Winter.

Swimming. Beginning, intermediate and advanced classes in strokes and diving. Class and Varsity.

American Red Cross Life Saving and Water Safety. Instructor's Course. (Upon successful completion of these courses, American Red Cross certificates will be awarded.)

Fall, Winter and Spring.

Tennis.

Fall, Winter and Spring. Class and Varsity.

Volleyball.*

Fall and Winter. Class and Varsity.

Water Ballet.*

Fall. Class and Performance Group.

*Co-ed classes.

PHYSICS

OLEXA-MYRON BILANIUK, *Professor*†

WILLIAM C. ELMORE, *Professor**

MARK A. HEALD, *Professor and Chairman*

PAUL C. MANGELSDORF, JR., *Professor*

ALBURT M. ROSENBERG, *Associate Professor*

JOHN R. BOCCIO, *Assistant Professor*

CYRUS D. CANTRELL, *Assistant Professor*

The physics department, through its introductory course in general physics, endeavors to give an integrated account of basic physics. In this course, as well as in the advanced work of the department, emphasis is placed on quantitative, analytical reasoning, as distinct from the mere acquisition of facts and skills. The introductory course makes no pretense of covering all material of interest to physicists, but rather comprises a selection of topics which form a coherent group.

Advanced work in the department involves a more intensive study of topics covered at the introductory level, and of many phases of modern physics which require a considerable background in mathematics and electricity. In all courses

*Absent on leave, fall semester, 1971-72.

†Absent on leave, spring semester, 1971-72.

PHYSICS

and seminars particular importance is attached to laboratory work, since physics is primarily an experimental science. Honors 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 research projects in consultation with members of the faculty. Good shop facilities, a wide range of electronic instrumentation, and the Computer Center are available in support of independent work. The Department holds research colloquia jointly with the Bartol Research Foundation, which is located on the Swarthmore campus and which offers a Ph.D. program in physics through an affiliation with Thomas Jefferson University (see p. 68). In special cases Swarthmore students may take graduate courses at Bartol or at the University of Pennsylvania.

REQUIREMENTS AND RECOMMENDATIONS

Students who intend to major in physics normally take Physics 1, 2 and Chemistry 3, 4 in the freshman year and Physics 11, 12 in the sophomore year. In addition they should complete Mathematics 22 by the end of their sophomore year. In view of graduate school requirements and of the extensive literature of physics in French, German and Russian, it is strongly recommended that the student acquire a reading knowledge of one of these languages. Satisfactory work in Physics 1, 2 or its equivalent is prerequisite for all further work in the department, and Chemistry 2 or 4 is a prerequisite for Physics 112 and 114.

Honors students majoring in physics normally take Physics 102, 106, 112, in that order, and Mathematics 51, 52, and 102. Physics 114 or a second mathematics seminar is encouraged but not required. Other seminars and courses in the program may be chosen to meet the interests of the student. Students preparing for graduate work in physics usually present four papers in physics and two in mathematics; one or two papers in chemistry, astronomy, engineering, economics, or another minor may be substituted. An Honors major with three papers in physics and greater diversity in the minors and supporting courses constitutes an effective educational program for careers in law, medicine, and other professions inasmuch as the aim throughout is to achieve an understanding of fundamental ideas and concepts, as distinct from the mastery of information, skills, and techniques in a limited segment of science. Honors students minoring in physics may prepare for examinations by taking Physics 11, 12, as well as by one or more seminars.

Course students majoring in physics normally complete the following courses in their junior and senior years: Mathematics 51, 52; Chemistry 61, 62; and Physics 51, 52, 54, 55, 72. It is recommended that Physics 60 or additional work in engineering or chemistry be included in the program of Course students who intend to do graduate work in physics. This program provides a well-rounded study of physics, and by requiring less intensive concentration than an Honors program offers the student more opportunity to extend his work outside the Division of the Natural Sciences. It should also meet the needs of those who wish to teach science in secondary school.

Secondary school students who are considering majoring in physics at Swarthmore are strongly encouraged to complete four years of mathematics and a minimum of two years of French, German, or Russian.

1, 2. General Physics. An introductory course in basic physics. During the first semester special emphasis is placed on mechanics, conservation principles, harmonic motion, wave motion and heat. During the second semester the topics include basic concepts in electricity and magnetism, direct current circuits, alternating current circuits, optics and modern physics. This course, or its equivalent,

PHYSICS

lent, must precede any advanced courses or seminars in physics. It is required of most science majors. Three lectures, a conference, and a laboratory period weekly. The introductory course can be supplemented by directed reading in current topics. Entering freshmen who may be qualified for advanced placement should see the department chairman.

Prerequisite: First year mathematics (calculus) taken concurrently, or adequate preparation in mathematics.

Mr. Cantrell, Mr. Heald, and Staff.

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. Recent developments in these fields are emphasized with readings 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.

Fall semester. Mr. Mangelsdorf.

7, 8. Concepts and Theories in Physical Science. The first semester consists of an analysis of motion leading to the Newtonian synthesis, the conservation laws of physics, the development of an atomic theory of matter, the periodic table of elements, and the kinetic theory of gases. The second semester considers the evolution of modern physics: physical properties of light, aspects of relativity, the wave versus the quantum theory of light, certain electrical phenomena, atomicity of charge, Bohr's model of the atom, radioactivity, elementary particles, the nuclear atom and nuclear energy, stellar energy.

This course is designed as a terminal course in physical science to meet the needs of non-science majors and fulfills the group 1 distribution requirement. It is not intended to fulfill the physics requirement of medical schools, and cannot be used as a prerequisite for further work in the Division of the Natural Sciences. Three lectures and one three-hour laboratory per week.

Not offered in 1971-72. Mr. Rosenberg.

7A. Concepts and Theories in Physical Science. A one-semester condensed version of Physics 7,8. Falling bodies and the birth of mechanics; Newton's laws of motion and gravitation; the classical physicist's "world view"; Einstein's relativity and space-time; the atom and the quantum; origin and interpretation of wave mechanics and the uncertainty principle. Text, R. H. March's *Physics for Poets*. Includes weekly laboratory.

Fall semester 1971. Mr. Rosenberg.

7B. Basic Physics Applied to Living Systems. Illustrations showing where physical theory and instruments are important in understanding living cells and organisms, integrated with a conceptual development of physical principles and techniques. Includes weekly laboratory. Not intended for biology and pre-med majors.

Fall semester 1971. Mr. Rosenberg.

9A. Order and Symmetry in Physical Systems. Analysis of the forms and principles involved in order and symmetry. A study of pattern as it arises from (1) statistical regularities governed by the laws of chance, (2) fluid behavior of streams and gas flows, and (3) geometrical packing or mathematical ordering. Examples selected from molecular systems, crystals, atoms, nuclei, and elementary particles. Symmetries in man-made designs will also be considered. The IBM 1130 computer and graphic display will be used in producing various

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patterns. Three lectures plus laboratory weekly. Intended for non-science majors.
Spring semester 1972. Mr. Rosenberg.

9B. 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 non-science majors.

Spring semester 1972. Mr. Rosenberg.

10. Topics in Biophysics. Applications of physical tools and analysis to living systems. Emphasis is at the subcellular level of integration. The course is intended for physical science, mathematics, and engineering students. Previous biological training is not required. Three lectures per week. In lieu of laboratory work, visits will be made to nearby biophysical laboratories.

Not offered in 1971-72. Mr. Rosenberg.

11, 12. Mechanics and Wave Motion. Particle and rigid body mechanics with an introduction to advanced dynamics. Elastic waves and wave motion. Interference and diffraction phenomena. Considerable emphasis is placed on laboratory work, both to illuminate and extend the subject matter, and to foster the students' ability to work independently. Three lectures and a laboratory period weekly. This course may be taken by Honors students with a minor in physics in preparation for an Honors examination.

Prerequisite: Second-year mathematics taken concurrently.

Mr. Boccio and Mr. Mangelsdorf.

21. Principles of Aeronautics. Principles of flight, elements of aircraft structure and performance, flight instruments, navigation aids and methods, flight meteorology. No prerequisites, open to all students. Two lecture hours and an afternoon ground lab weekly.

Fall semester. Mr. Bilaniuk.

51. Modern Physics I. A selection of topics including the special theory of relativity, and atomic, nuclear, and particle physics. Three lectures and one laboratory period weekly. Open to seniors only.

Prerequisite: Second-year mathematics and consent of the instructor.

52. Modern Physics II. Quantum mechanics and solid-state physics.

Three lectures and one laboratory period weekly.

Prerequisite: Physics 51 and/or Engineering 61.

54. Thermal Physics. Continuum properties of matter and of thermal energy. Thermodynamics and statistical mechanics of mechanical, chemical, electrical and magnetic systems. Entropy, fluctuation theory, irreversible thermodynamics. Brownian motion, diffusion theory, transport processes. Three lectures and one conference section weekly.

Prerequisite: Second-year mathematics.

55. Introduction to Fields and Continua. Analysis of field phenomena in a variety of continuous media. Fluid-flow, elastic, thermal, electromagnetic, and other fields are treated with emphasis on their common properties. The partial differential equations governing time-invariant fields, diffusion, wave motion, etc., are developed from basic principles. Application is made to realistic engi-

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neering situations. Three class periods and a laboratory each week. Also listed as Engineering 51.

Prerequisite: Physics 12.

Fall semester. Mr. Patterson.

60. Special Project. Laboratory work directed toward the acquisition of knowledge and skills that will be useful in future research. The project ordinarily involves development of apparatus and the performance of an experiment of contemporary significance in physics. An oral and written report will be presented to the instructor.

61. Directed Reading. This course is to provide an opportunity for individual students to do special work in fields not covered by the undergraduate courses listed above. Weekly topics and problems will be assigned, and the student will present oral and written reports to the instructor.

62. Introduction to Oceanography. The theory and practice of modern marine sciences. Topics to be covered include physical oceanography and measurement techniques, the dynamics of rotating stratified fluids, air-sea interaction, coastal and estuarine processes, the ocean as a biological habitat, and the energy, mass, and chemical budgets of the oceans. This course is intended to enable the student to follow current literature in marine sciences. Exercises on the computer and a field trip.

Prerequisite: Mathematics 51 or consent of the instructor.

Spring semester. Mr. Mangelsdorf.

71. Circuit Theory. Transient and steady-state analysis of electric circuits and networks with emphasis on Laplace and Fourier methods and s-plane interpretation. Network topology, equilibrium equations, theorems, network functions and their properties. Energy in electric networks. Introduction to synthesis.

Three class periods and a laboratory each week. Also listed as Engineering 71.

Prerequisite: Physics 12.

Fall semester. Mr. McCrumm.

72. Electromagnetic Theory. Application of Maxwell's equations. Macroscopic field treatment of magnetic, dielectric and conducting bodies. Forces, motion and energy storage. Field basis of circuit theory. Electromagnetic waves; wave guides, transmission lines and antennas. Three class periods and a laboratory each week. Also listed as Engineering 72.

Prerequisite: Physics 55.

Spring semester.

HONORS SEMINARS

102. Electricity and Magnetism. Classical electrodynamics, covering static and dynamic electricity, magnetism and electromagnetism, with some electronics. Laboratory measurements in direct and alternating currents and in magnetism, together with fundamental experiments in electronics.

Prerequisites: Mathematics 22, and Physics 11, 12.

Fall semester. Mr. Heald.

106. Atomic and Nuclear Physics. Special theory of relativity. Wave-particle duality. Introduction to wave mechanics, the hydrogen atom, structure and spectra of many-electron atoms. Elements of solid state physics. Properties and systematics of nuclei, nuclear reactions, nuclear forces and models. Introduction

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to fundamental particles, their symmetries, and interactions. The accompanying laboratory includes basic experiments in atomic and nuclear physics.

Prerequisite: Physics 102, or equivalent preparation in the Honors program in Engineering Sciences.

Spring semester. Mr. Elmore.

112. Radiation and Statistical Physics. Free and guided electromagnetic waves, with particular emphasis on waves in the microwave, optical, and X-ray regions. The velocity of electromagnetic waves and the four-vector formulation of the special theory of relativity. Thermodynamics and statistical mechanics. Thermal radiation, and quantum statistics with applications. Accompanied by experimental projects.

Prerequisites: Chemistry 2 or 12, and Physics 106.

Fall semester. Mr. Mangelsdorf.

114. Quantum Mechanics. Advanced classical dynamics. Classical vs. quantum physics, correspondence principle. Heisenberg's and Schrödinger's versions of quantum mechanics. Observables and quantum mechanical operators. Eigenfunctions and eigenvalues. Approximation methods. Identical particles and spin. Scattering and the Born approximation. Quantum mechanics of the nucleon-nucleon interaction and nuclear structure.

Prerequisite: Physics 112.

Spring semester.

POLITICAL SCIENCE

CHARLES E. GILBERT, *Professor*

J. ROLAND PENNOCK, *Professor**

DAVID G. SMITH, *Professor and Chairman*

ROBERT O. KEOHANE, *Associate Professor†*

CLEMENT COTTINGHAM, JR., *Assistant Professor*

RAYMOND F. HOPKINS, *Assistant Professor*

NANNERL O. KEOHANE, *Assistant Professor (part time)†*

ROBERT GALLUCCI, *Instructor*

KENNETH G. LIEBERTHAL, *Instructor***

PAUL LUTZKER, *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 the elements 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

*Absent on leave, fall semester, 1971-72.

†Absent on leave, spring semester, 1971-72.

‡Absent on leave, 1971-72.

**Spring semester, 1971-72.

POLITICAL SCIENCE

the needs of our day. Courses are provided that give special attention to political theory, comparative political systems, political development, politics and government in the United States, and international relations.

REQUIREMENTS AND RECOMMENDATIONS

Students planning to study political science are strongly advised to start with Elements of Politics (Political Science 1), and to continue with one or more of the other introductory level courses, Policy-Making in America (Political Science 2), Comparative Politics (Political Science 3), International Politics (Political Science 4). Any one of these courses may be taken without prerequisite and as a terminal course. Normally any two of these courses, preferably including Political Science 1, constitute the prerequisite for further work in the department. Students who intend to major in political science should begin their work in the freshman year if possible. Political Theory, either in seminar for Honors students, or in course (Political Science 54) for Course students, is required of all majors. Course majors must take Political Science 60.

PROGRAM IN INTERNATIONAL RELATIONS

Students who plan to enter upon a career in the field of international relations 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 a modern language.

Those students who wish to concentrate in international relations may take their Senior Comprehensive Examination in this field. Students preparing for this examination should take eight, nine, or ten courses from among those listed below, including all of those listed in Group I, one or more in Group II, and one or more in Group III. A thesis or other form of independent work is strongly recommended. The examination is administered by a committee appointed by the chairmen of the Departments of Economics, History, and Political Science, under the chairmanship of the Department of Political Science.

Group I

- Political Science 4—International Politics
- Political Science 13—International Law and Organization
- Political Science 14—American Foreign Policy
- Political Science 63—Advanced International Politics
- Economics 30—International Economics

Group II

- History 8—Africa
- History 25—Modern Russia
- History 35—American Diplomatic History to 1900
- History 36—American Diplomatic History since 1900
- History 43—The Expansion of Europe
- History 44—Modern China
- History 45—Modern Japan
- History 46—Asian Nationalisms
- History 48—Latin America

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Group III

- Economics 11—Economic Development
- Economics 31—Comparative Economic Systems
- Political Science 3—Comparative Politics
- Political Science 18—Politics of Developing Nations
- Political Science 19—Comparative Communist Politics
- Political Science 20—Politics of East Asia
- Political Science 21—Politics of Africa
- Political Science 55—Modern Political Theory
- Political Science 64—Topics in International Relations

Students who plan to enter the Honors program will find it possible to select a similar combination of courses and seminars in the field of international relations. In planning such programs, they should consult with the chairman of their prospective major department.

1. Elements of Politics. Using materials particularly from the United States and the Soviet Union, but drawing also on experiences of other societies, this course asks: Who governs? How? Under what constraints? It therefore involves a study of the basic institutions, concepts and moving forces of politics. Through the use of readings from contemporary political sciences, it also presents an introduction to the analytical tools and methods of the discipline. Normative problems of freedom and authority, equality and inequality, obligation and protest, are considered in conjunction with the study of political forces and institutions.

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.

Spring semester. Staff.

3. Comparative Politics. An introduction to the theory of comparative politics, and to the data used in comparing political systems. Major attention will be given to Great Britain, India, France, and the USSR. The course will focus on political culture, the party system, and the legislative and executive institutions of the central government.

Spring semester. Staff.

4. International Politics. An introduction to the analysis of the contemporary international system and its evolution since 1945. The course will consider the foreign policies of major powers and their interaction, contemporary forces influencing the nature of international relations, and the role of ideologies. Various approaches to world order, such as diplomacy, collective security, disarmament and world government will be considered.

Spring semester. Staff.

10. Urban Sociology and Politics. Also listed as Sociology-Anthropology 59. Particular emphasis will be placed on the politics and sociology of the contemporary American city and upon aspects of the urban crisis that relate especially to racial and economic segregation. The course will examine the way in which urban problems become defined and major alternative approaches toward the

POLITICAL SCIENCE

resolution of these problems. This course is required for students who wish to take Problems in Urban Education and/or Problems in Urban Housing.

Spring semester. Mr. Cottingham and Mr. Van Til.

11. Problems in Urban Housing. See Sociology-Anthropology 59A. Students who take this course are required to take Urban Sociology and Politics concurrently.

Spring semester. Mr. Van Til and Mr. Willis.

12. Problems in Urban Education. See Education 17. Students who take this course are required to take Urban Sociology and Politics concurrently.

Spring semester. Mrs. Brodhead and Mr. Cottingham.

13. International Law and Organization. An analysis of international law and organization in the context of the international political system. Special attention will be given to the political process of the United Nations and to its accomplishments, limitations, and prospects. The course will also consider the relations between international politics and international law, and the theory and practice of regionalism.

Alternate years, spring semester. Not offered in 1971-72. Mr. Keohane.

14. American Foreign Policy. The problem of defining the objectives of American foreign policy and of selecting the means for achieving them; past, present and suggested American strategies in world politics; the influence of internal and external conditions on the making of foreign policy; the effects of American policies in crucial areas of the world.

Spring semester. Mr. Gallucci.

15. Legislative Behavior. An analysis of the various forces that shape the results of the legislative process and the behavior of individual legislators. The influence of personality, constituency, party leadership, ideology, rules and procedures, the committee system, the Executive Branch. The main focus will be on the Congress, with some illustrative material from other legislative bodies.

Fall semester. Not offered in 1971-72. Mr. Lutzker.

18. Politics of Developing Nations. Non-western states of Africa, Asia and Latin America will be studied. Individuals, groups, and institutions that are politically important will be analyzed with respect to their role in effective power processes and in promoting or hindering developmental changes.

Fall semester. Mr. Hopkins.

19. Comparative Communist Politics. A comparative study of the political organization of the Soviet Union, China, and the Eastern European states, with emphasis on the Party structure, state bureaucracy, policy formation, and political communication.

Spring semester. Not offered in 1971-72. Mr. Lieberthal.

20. Politics of East Asia. A comparative analysis of politics in China and Japan. Special emphasis will be placed on China: the Chinese Revolution, ideology, policy-making, local politics, and the Cultural Revolution.

Spring semester. Mr. Lieberthal.

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, neo-colonialism, military intervention and national integration.

Spring semester. Mr. Hopkins.

POLITICAL SCIENCE

47. Marxist Political Economy. A study of Marxist economics and political theory with particular attention to general problems of historical materialism. Primary emphasis in the reading is placed on the works of Marx, Engels, and Lenin; however, some time is also devoted to the background of Marxist thought as well as the development of Marxist theory in the present era. Also listed as Economics 47.

Prerequisite: two semesters of either Political Science or Economics.

Spring semester. Mr. Pryor and Mr. Smith.

51. Public Administration. An analysis of policy-making and administration in modern governments with illustrative material drawn chiefly from the national government of the United States and with particular reference to recent developments. Problems of administrative organization, conduct of regulatory and managerial activities, financial administration, personnel, public relations, administrative law, politics and administration.

Open to juniors and seniors only, except by special arrangement.

Fall semester, alternate years. Mr. Smith.

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 development emphasized are: the nature and exercise of judicial review; federalism and the scope of national power; due process, equal protection and other civil liberties.

Open to sophomores and upperclassmen.

Spring semester. Mr. 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.

Alternate years, fall semester. Not offered in 1971-72. Mr. Lutzker.

54. Political Theory: Plato to Montesquieu. The development of political thought based on the work of the chief political philosophers from Plato to Montesquieu. The course will consider classical, medieval, and early modern theories concerning: the sources of authority and obedience; the origins and functioning of the polity; the role of law in government; the relationship between the state and the individual; and the character of the good state.

Open to sophomores planning to take the "Modern and Analytical" version of the Political Theory honors seminar; otherwise to juniors and seniors only, except by special arrangement.

Fall semester. Mrs. Keohane.

55. Modern Political Theory. A study of the development of liberalism, socialism, democratic theory, and sociological theories of politics. The course includes intensive reading of a few works by Rousseau and Marx plus discussion of other such authors as Burke, Tocqueville, Mill, Lenin, and Weber. In a concluding section, several contemporary democratic theories will be considered.

Spring semester. Mrs. Keohane or Mr. Smith.

56. Jurisprudence. A study of the sources and nature of law; historical, sociological and philosophical approaches to legal theory; the nature of the judicial process; key problems of jurisprudence illustrated by case study in selected areas of American constitutional law.

Open to juniors and seniors only, except by special arrangement.

Spring semester. Mr. Pennock.

POLITICAL SCIENCE

57. Problems of Democratic Theory. Individualistic, pluralistic, and "holistic" approaches will be studied, including contemporary attacks upon liberalism and pluralism. Democracy will be considered from the point of view of justification theory, theories of requisites, and both normative and descriptive operative theory.

Fall semester. Not offered in 1971-72. Mr. Pennock.

60. Special Topics in Political Science. This course, conducted in seminar fashion, is designed for senior majors. By means of papers and assigned readings it covers aspects of political science not elsewhere intensively developed and helps the students to integrate materials studied previously.

Spring semester. Mr. Smith.

62. Political Sociology. Sociological analysis of political elites, politics and political institutions in comparative-historical perspective. Although the major focus will be on modern societies, a part of the course will be devoted to pre-modern, primarily medieval European conditions and the rise of the modern nation-state. Particular emphasis will be given to theories and empirical studies of various types of protest movements in historical and contemporary societies. Also listed as Sociology and Anthropology 62.

Fall semester. Mr. Mueller.

63. Advanced International Politics. This course will consider foreign policies of small and middle powers in contemporary world politics. Attention will be paid not only to their conventional diplomatic problems but also to their interactions with multilateral institutions and their relations with transnational actors, particularly in the economic field. The course will therefore attempt to analyze world politics from the perspective of small states, as well as to compare these states' efforts to cope with the situations they encounter. Prerequisite: Course 4 or the equivalent.

Alternate years, fall semester. Mr. Keohane.

64. Topics in International Relations. An analysis of certain problems of international relations chosen by the instructor. Possibilities include: comparative foreign policy, war, international relations of developing nations, regionalism. Prerequisite: Course 4 or the equivalent and Course 63.

Alternate years, spring semester. Not offered in 1971-72. Mr. Keohane.

69. Directed Readings in Political Science. Available on an individual or group basis, subject to the approval of the chairman and the instructor.

70-71. Colloquium. Staff.

72. 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.

HONORS SEMINARS

The following seminars prepare for examination for a degree with Honors:

101. (a) and (b) Political Theory. The nature of the state, the bases of political obligation, sovereignty and the nature of law, liberty, equality, rights, democracy, totalitarianism—all in the light of the theories set forth by writers on these subjects from Plato to the present. This seminar is given in two versions, one (101a) beginning with Plato and proceeding chronologically, and the

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other (101b, designated "Modern and Analytical") starting with Hobbes, organized in more topical fashion and giving considerable attention to modern democratic theory. It is desirable but not required for students planning to take 101b to take Political Science 54 during their sophomore year.

Each semester. Mr. Pennock or Mr. Smith.

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, ultimately, on politics from the standpoint of theories of political democracy.

Spring semester. Mr. 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. Mr. Smith.

104. International Politics. An inquiry into the principles and problems of international politics, this seminar will consider theories of international stability and disorder, the relationship between foreign policies and the international system, and approaches to international order such as diplomacy, international law, and collective security. Basic to the analysis will be the question: what are the causes of war and the conditions of peace?

Prerequisite: Course 4 or the equivalent.

Spring semester. Not offered in 1971-72. Mr. Hopkins.

105. American Foreign Policy. A study of key problems faced by the United States in the modern world together with a detailed, critical investigation of the making and implementing of American foreign policy. A variety of purported explanations of American foreign policy will be discussed and evaluated, and the political economic and social influences upon it will be carefully considered. Key assumptions of United States policy-makers will be subjected to scrutiny, and alternate assumptions and policies will be analyzed.

Fall semester. Mr. Keohane.

106. Public Law and Jurisprudence. Sources and nature of law; historical, sociological, philosophic, "realistic," and behavioral approaches to law; key problems of jurisprudence illustrated by the study of court cases, especially, but not solely, from selected areas of public law.

Spring semester. Mr. Pennock.

107. Comparative Communist Politics. A comparative study of the political organization of the Soviet Union, China, and the Eastern European states, with emphasis on the Party structure, state bureaucracy, policy formation, and political communication.

Spring semester. Mr. Lieberthal.

108. Comparative Politics. A comparative study of several Western European democracies. Great Britain, France, and Italy will be the major countries studied, but attention will also be paid to Germany, Switzerland, Scandinavia and the Low Countries. The seminar will focus on theories proposed to explain successful democracy, and attempt to determine how far these theories are borne out in the countries studied. Political culture, the party systems, and group participation in government will receive special attention.

Fall semester. Not offered in 1971-72. Mrs. Keohane.

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109. Political Development. A comparative study of the politics of societies undergoing change and modernization. Various theories, approaches, and methods of explanation are examined and considered in the context of states in Asia, Africa, the Middle East and Latin America.

Spring semester. Mr. Hopkins.

110. Urban Sociology and Politics. The impact of urbanization on contemporary politics and social structure, from the perspectives of political science and sociology. Emphasis will be placed on empirical study of selected problems such as physical planning, social welfare, and political organization.

Fall semester. Not offered in 1971-72. Mr. Gilbert and Mr. Van Til.

129. Thesis. Approval must be secured early in the student's junior year. All members of the department.

PSYCHOLOGY

KENNETH J. GERGEN, *Professor and Chairman*

DEAN PEABODY, *Professor*

HANS WALLACH, *Professor*

SHEL FELDMAN, *Associate Professor*†

BARRY SCHWARTZ, *Assistant Professor*

JEFFREY TRAVERS, *Assistant Professor*

CLAUS BAHNSON, *Lecturer*

MARY K. GERGEN, *Assistant*

The work of the Department of Psychology deals with the scientific study of human behavior and experience; the basic processes of perception, learning, thinking and motivation, and consideration of their relation to development of the individual personality; and the social relations of the individual to other persons and to groups. For those students planning graduate and professional work in psychology 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. Other 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 joint major is available in conjunction with the Linguistics Department emphasizing fundamental issues in human cognitive organization. A full description of this program may be found under "Linguistics."

REQUIREMENTS AND RECOMMENDATIONS

There is no required introductory course in Psychology. However, the following courses may be considered pre-requisites for more advanced work in the Department.

Psychology 12: Experimental Psychology (Fall)

Psychology 16: Social Psychology (Fall)

Psychology 18: Personality (Spring)

Students who wish to pursue advanced work in learning, perception or physio-

†Absent on leave, spring semester, 1971-72.

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logical psychology should take Psychology 12. Those who wish to do advanced work in child development, abnormal psychology, or other areas dealing with human interaction should take Psychology 16 or 18 or both. Psychology majors will be expected to take Psychology 12 and either Psychology 16 or 18.

Majors should include advanced work in two areas of psychology: (a) basic processes underlying human and animal behavior, such as perception, learning and physiological psychology; (b) human behavior in its social context, such as personality, child psychology, social psychology. Majors in Course should take at least two courses and majors in Honors, at least one seminar from each area. It is highly desirable for all majors to take at least one course providing them with experience in basic research (e.g. Psychology 54 or 69). In addition, all majors in Course are encouraged to enroll in Psychology 64 during the spring semester of their senior year. This course is especially suited for preparation for the comprehensive examinations.

12. Experimental Psychology. A basic introduction to the areas of learning, perception, cognition and psychophysiology.

Fall semester. Staff.

13. Statistics for Psychologists. See Math 1.

Fall semester. Mr. Mullins.

15. Child Psychology. Cognitive development, the socialization process, and the influence of childrearing practices will be emphasized.

Spring semester. Mr. Travers.

16. Social Psychology. An examination of theory and research relevant to the understanding of social interaction from a psychological viewpoint. Special emphasis will be placed on social perception and its distortion, attitude development and change, conformity, the relationship of personality to social interaction, and social motivation.

Fall semester. Staff.

17. The Mathematics of Social Choice. See Mathematics 19.

Fall semester. Mr. Klotz.

18. 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 empirical work.

Spring semester. Staff.

36. Primate Social Behavior.

37. Learning and Behavior Theory. The experimental analysis of the major phenomena of learning and conditioning is studied mainly at the animal level. Specific empirical and theoretical issues are considered in detail, and the major theories are evaluated. The laboratory is designed to acquaint students with the major processes considered.

Spring semester. Mr. Schwartz.

38. Abnormal Psychology. Several views of abnormality are considered, including those that allow conceptions of normality. Biological and learned bases of positive and negative abnormality are considered, along with various methods of behavior modification and psychotherapy.

Spring semester.

41. Comparative Psychology.

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42. **Physiological Psychology.**

43. The Psychology of Communication. Topics such as non-verbal behavior and self-disclosure, language acquisition and the Whorf hypothesis, propaganda and rumor are approached from the perspectives of psychological and linguistic theory. Attempts to integrate studies of mass and interpersonal communication. Not offered in 1971-72.

45. Group Dynamics. The course will deal with the psychological aspects of behavior in groups. Issues such as intimacy, solidarity, group problem solving, leadership development, splinter-group formation, and phases of group development will all receive attention. Classroom sessions will focus on the ongoing behavior within the group itself. Outside reading and papers will be used to illuminate processes within the group and to raise significant theoretical problems. (By application only.)

Fall semester. Mr. Gergen.

46. Cognitive Processes. Centers on those processes the individual uses to understand the world. Emphasizes those processes used in dealing with people, and their relation to those dealing with impersonal objects.

Fall semester. Mr. Peabody, Mr. Travers.

48. Intergroup Relations. An examination of factors that create strife and conflict among persons, and conditions enhancing interpersonal tolerance and acceptance. Particular attention will be given to minority groups, race relations, and communication between individuals of diverse backgrounds.

49. The Psychology of Language. See Linguistics 2.

Spring semester. Mrs. Gleitman.

50. Perception. Laboratory section one afternoon per week to be arranged. The major facts and some problems of visual perception are outlined and used to acquaint the student with experimental research.

Spring semester. Mr. Wallach.

52. Human Learning and Thinking. An examination of the phenomena of association, memory, problem solving, thinking and language.

54. Methods of Psychological Research. Discussion will focus on the relationships between given theories and the methods used in the supporting research. The comparative advantages and disadvantages of participatory observation and analysis, "objective" naturalistic observation, interviewing, content analysis, and experimentation will be examined. Particular attention will be given to problems in sampling, measurement and scaling, reliability and validity, and controls against artifacts and alternative explanations. Direct research experience will be emphasized.

Fall semester. Mr. Gergen.

59. Ethological Psychology. A course in seminar format. Will elaborate the general principles which characterize ethology, and examine behavior systems such as feeding, sex, aggression, and communication in various species, including man. The behavior systems will be studied with an emphasis on the contrasts between ethology and American learning theory. (Entrance by permission of instructor.)

Fall semester. Mr. Schwartz.

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- 60. Psychological Aspects of Economics.** See Economics 45.
Spring semester. Mr. Peabody, Mr. Pryor and Mr. Travers.
- 61. Psychological Anthropology.** See Sociology 63.
- 64. History and Systems of Psychology.** Reading and discussion on a tutorial basis intended to provide integration of different fields of psychology and to help majors prepare for comprehensives. Historical treatment will concentrate on the major systematic points of view. Special consideration will be given to problems overlapping several areas of psychology.
Spring semester. Mr. Peabody.
- 66. Senior Paper.** Students who wish to do a comprehensive paper in the spring semester of their senior year—in lieu of comprehensive exams—may do so with the permission of the department.
Spring semester. Staff.
- 67. Social Psychology of Social Issues.** A course in seminar format. Students consider the scientific approach to issues of social significance. Areas such as race relations, international conflict, poverty, urbanism, drugs, and revolution may all be discussed. (Enrollment limited.)
- 68. 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 to him, and in consultation with a faculty member, prepare a reading list and work plan. Tutorial work may include field experience outside Swarthmore.
Each semester. Staff.
- 69. 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.

NOTE: Under special circumstances, courses from other departments may be counted toward a major in psychology, especially when such courses take a distinct psychological orientation to the subject matter. Permission required.

HONORS SEMINARS

- 101. Perception.** Reading and discussion combined with independent experimental projects. The student is expected to know the basic facts about human perceptual mechanisms, particularly visual ones, by the time he has completed this seminar. Specific topics covered are: color vision, grouping and form, depth and distance, size, visual motion, visual and auditory localization, recognition, adaptation of perceptual functions. Scheduled laboratories are devoted to demonstrations.
Fall semester. Mr. Wallach.
- 102. Learning and Behavior Theory.** The major phenomena of learning and conditioning—taken largely from the animal level—are discussed. An attempt is made to systematize the experimental literature on each topic. The relationship of motivational concepts to learning is discussed and the major theories of learning and some recent mathematical theories are considered. The laboratory

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acquaints students with problems and methods of experimentation in learning. An opportunity for original research is provided.

Spring semester. Mr. Schwartz.

103. Abnormal Psychology. Two conceptions of abnormal behavior, the psychoanalytic and the social psychological, are examined, mainly from a developmental point of view. Problems of state and trait, and of cognitive, affective, and behavioral change are considered.

Fall semester.

104. Individual in Society. The relationship between man and his society. Basic processes including the understanding of other persons, theories of cognitive consistency, group influence and conformity, the psychology of language. Applications to political attitudes, group prejudice. The relation of attitudes and personality. The relation of psychology to the social sciences.

Spring semester. Mr. Peabody.

105. Personality. A scrutiny of attempts to build an objective basis for "understanding the person as a whole." Contrasting theoretical orientations, techniques of observation, and specific problems will be examined. Theoretical orientations: psychoanalysis, factor analysis, learning theory, phenomenology. Observation techniques: interviews, questionnaires, fantasy material. Problems: aggression, need achievement, prediction, psychotherapy, and psychological maturity.

Spring semester. Mr. Gergen.

107. Language and Thought. See Linguistics 107.

Spring semester. Mrs. Gleitman.

109. Physiological Psychology. The genetic, developmental, and physiological determinants of animal behavior. The seminar will explore in detail experimental and field studies of behavior in a few selected animal species. Generalizations derived from the study of animal behavior will be brought to bear on problems in human behavior and behavior pathology.

Spring semester.

110. Group Dynamics. A combination of Psychology 45 (Fall) and a subsequent semester of empirical research.

Fall and spring semester. Mr. Gergen.

111. Cognitive Development. A detailed survey of theory and research on cognitive development, with intensive study of selected problems. Topics include: growth of sensory and motor skills in infancy, language acquisition, and changes in cognitive functioning during the preschool, elementary school and preadolescent years. All members of the seminar will take part in observation, experimentation or teaching of young children.

Fall semester. Mr. Travers.

112. Social Development. The process of child development, with special emphasis on topics related to social interaction, including altruism, aggression, morality, and personality.

120. 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. All members of the department.

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MASTER'S DEGREE

A limited number of students may be accepted for graduate study toward the Master's degree in psychology (see pp. 74-75). Students receiving the Bachelor's degree from Swarthmore are not encouraged to enter this program.

The program of work for the Master's degree requires the completion of four seminars, or their equivalent. One of the seminars must be a research seminar leading to a Thesis. The work of the seminars is judged by external examiners. The requirements for the Master's degree can normally be completed in one year.

RELIGION

JOHN M. MOORE, *Professor*

P. LINWOOD URBAN, JR., *Professor and Chairman*

PATRICK HENRY, *Associate Professor*

DONALD SWEARER, *Associate Professor*

SAMUEL T. LACHS, *Visiting Lecturer*

FLETCHER J. BRYANT, JR., *Assistant Dean of Admissions*

The academic discipline of religion applies several methodologies to a broad subject matter. Understanding of religion is achieved in various ways: by philosophical, historical, literary, phenomenological, psychological and sociological analysis of religious experience, thought, texts, rites and ceremonies, institutions. Department offerings illustrate a number of approaches to the study of religion.

Any course numbered 3 through 6 may be taken as an introduction to the field, and successful completion of one of these is normally required for admission to courses numbered 11 and above. The normal prerequisite for religion as a Course major, or an Honors major or minor, is completion of two courses.

Among the 8 courses required in the major at least one course must be taken in each of three broadly-defined areas: a) the religions of Asia and Africa; b) the history of the western religious traditions; c) the philosophical and/or theological aspects of religion. Also required is Religion 54, Conference for Majors.

Honors majors must prepare for examinations in at least two of the areas defined above, and must do work in the third area either for an examination or in a course. Examinations may include topics in Old and New Testament, history of Judaism and Christianity, philosophy of religion and ethics, the comparative study of religions, and Asian religions. Supplementary work at Bryn Mawr or Haverford Colleges may, where appropriate, be used to prepare for examinations.

For advanced work in some areas of religion, foreign language facility is desirable. A student should consult members of the department on the appropriateness of various languages, whether ancient or modern, for his own particular interests.

3. Introduction to the Old Testament. A study of the development of the religion of ancient Israel through an analysis of its literature and history.
Fall semester. Mr. Henry.

4. Introduction to the New Testament. A study of continuities and transformations in the emergence of Christianity and its development during the first century A.D. through an analysis of its literature and history.
Spring semester. Mr. Henry.

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5. Introduction to Asian Religions. An introduction to the study of religion through an examination of selected phenomena from the religious traditions of India and China. Attention will focus on Hinduism, Buddhism and Islam in India and Confucianism and Taoism in China.

Fall semester. Mr. Swearer.

6. 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, Reinhold Niebuhr, Teilhard de Chardin, Paul Tillich and others. The student is encouraged to find his own answers and to work out his own religious beliefs.

Each semester. Mr. Urban.

Each semester the introductory courses will meet together for the first two or three weeks in order to introduce students to some basic methodological issues and possibilities in the study of religion.

11. Early Christianity. The intellectual, social and organizational development of Christianity as it became the dominant religious force in the Roman Empire and on its fringes. Among the issues to be studied will be theological adjustments required by the constantly changing place of the church in society.

Fall semester. Mr. Henry.

12. Christianity Since the Reformation.

Spring semester. Not offered 1971-72. Mr. Henry.

13. Theravada Buddhism: A Social History. The course will take up the following issues: 1) the cultural and historical context in which Buddhism emerged in India 2500 years ago; 2) classical Theravada doctrines, and their correlates in contemporary religious institutions in Theravada societies; 3) the juxtaposition of Buddhist and non-Buddhist religious elements in Theravada societies; and 4) the reciprocal relationship between Buddhism and social and political change in contemporary SE Asia. Also listed as Sociology Anthropology 64.

Fall semester. Mr. Swearer or Mr. Piker. To be offered in 1972-73 by Mr. Piker.

14. Religion in East Asia. A critical study of selected religious phenomena in China and Japan with particular attention to forms of Mahayana Buddhism and their interaction with Taoism, Confucianism and Shintoism.

Fall semester. Mr. Swearer.

15. The Contemporary Black Church in Historical Perspective. An analysis of the present day Black Church and its relationship to the historical struggle for liberation of the Black community. This course will examine the development of the Black Church as it parallels the slave era, reconstruction, Black Nationalist Movement of the 1920s, Black northern migratory patterns, and contemporary Black social, political and theological movements. *Half-course.*

Spring semester. Mr. Bryant.

16. Philosophy of Religion. See Philosophy 16.

Fall semester. Mr. Bennett.

18. Basic Christian Doctrines. This course will be divided into three parts. Part I will be historical centering on the Trinity, Christ, and the Atonement as

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conceived in Scripture and the early church. Part II will comprise a two-week reading period during which time students will try to identify the major issues which have been raised during Part I and begin to read other writings on these themes. An integral element in Part II will be a conference with the instructor. After the end of the Reading Period, we will meet to plan Part III. Part III will comprise a series of meetings for which students will prepare papers for discussion expounding and evaluating the views of Medieval, Reformation, or Contemporary writers on the major themes discussed in Part I or papers which attempt to resolve problems raised in Part I. Such thinkers may include St. Thomas Aquinas, St. Augustine, K. Barth, R. Bultmann, M. Buber, John Calvin, Meister Eckhart, K. Rahner, Teilhard de Chardin, and P. Tillich. Issues may include the quest for the historical Jesus, the interpretation of key concepts in the theology of the early church, and the contemporary relevance of early Christian theology.

To be offered 1972-73. Mr. Urban.

19. Medieval Philosophy. Philosophical thought from Augustine to the 15th century. Attention will be paid both to specific problems such as universals, analogy, and epistemology and to outstanding thinkers such as Anselm, Aquinas, and Ockham. Although the primary emphasis will be historical, attention will be given to the contemporary relevance of medieval thought. (Also listed as Philosophy 19.)

Fall semester. To be offered 1972-73. Mr. Urban.

20. Existentialism and Religious Belief. A study of one of the most influential philosophical movements of the twentieth century and its impact on religious thought. Among philosophers attention will be given to the writings of Edmund Husserl, Martin Heidegger, Karl Jaspers, and Jean-Paul Sartre. Among religious thinkers the writings of Rudolph Bultmann, John Macquarrie, Gabriel Marcel, and Paul Tillich will be read. Lectures, discussions, and reports. (Also listed as Philosophy 20.)

Spring semester. Mr. Urban.

21. Jewish Ethics and Theology. Readings in Jewish literature centering on the concepts of God, man, and society, e.g. Bible, Talmud, Medieval and Modern Jewish thinkers. Attention will be given to the historical background of each writing.

Spring semester. Mr. Lachs.

22. Religion and Literature. Aspects of the relationship between poetic sensibility and religious insight and between the world of religious metaphysics and the imaginative world of the writer. Materials will be taken mainly from the English traditions of preaching, poetry, and fiction. (Also listed as English Literature 80.)

Prerequisites: English I and one of the Religion courses numbered 3 through 6.

Spring semester. Miss Snyder and Mr. Henry.

23. Early Christian Writings. An advanced course in some special topic in the history of early Christianity, which may vary from year to year.

Not offered 1971-72. Mr. Henry.

24. Mysticism East and West. Mysticism will be studied within the contexts of various religious traditions including Christianity, Judaism, Islam, Hinduism, Buddhism and Taoism. Philosophical and psychological analyses of mysticism will be considered in addition to a study of its nature and role as a type of religious phenomenon.

Not offered 1971-72. Mr. Swearer.

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25. Religious Classics. An advanced course in the study of one or two great religious thinkers.

Not offered 1971-72. Mr. Urban.

26. Religion as a Cultural Institution: Monasticism. An examination of Buddhist and Christian monasticism, the nature and form of the monastic life and the contribution of monasticism to these two religious traditions will serve as material for reflection on methodological issues in the study of religion as a cultural institution.

Spring semester. Messrs. Swearer and Henry.

29. Sociology of Religion. See Sociology and Anthropology 29.

Not offered 1971-72.

31. Religion and Ethics. The perennial problems of ethics and their relationship to religious perspectives. Attention will be given to the analysis of moral and religious discourse. Both classical and contemporary authors will be examined. (Also listed as Philosophy 31.)

Prerequisite: Philosophy 1 or one of the courses numbered Religion 3 through 6, or the consent of the instructors.

Fall semester. Messrs. Oberdiek and Urban.

32. Buddhist Texts in Translation. A selected number of Theravada and Mahayana Buddhist texts will be studied from historical-critical and doctrinal-philosophical points of view. An advanced course for students who have done previous study in Asian religions.

Not offered 1971-72. Mr. Swearer.

37. American Religious Thought. See History 37.

Fall semester. Mr. Cross.

38. Quakerism. The history of the Society of Friends to the present day. The characteristic religious and social ideas of the Quakers are considered in their historical setting.

Spring semester. Mr. Moore.

52. Thesis. Majors in religion are strongly encouraged to write a thesis as a part of their program.

53. Directed Reading.

54. Conference for Majors. Methodologies in the study of religion. An examination of selected representatives of the following approaches to the study of religion: sociology, anthropology, psychology, phenomenology and philosophy. Open to non-majors with consent of the instructors.

Spring semester. Staff.

HONORS SEMINARS

103. Early Christianity. A study of the development of Christian thought and institutions from the end of the first century to the Council of Chalcedon (A.D. 451). Specific subjects covered will depend on the students' interests. Among topics which might be considered are church and empire, missionary expansion, episcopacy, sacraments and liturgy, councils, doctrinal development and dogmatic definition, heresy, beginnings of monasticism. Greek and/or Latin, as well as French and German, while not required, can be employed extensively.

Spring semester. To be offered 1972-73. Mr. Henry.

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104. Origen and Augustine. A study of two major responses to the issues posed by the confrontation of Christianity and classical culture and by the need for Christianity to develop a coherent and comprehensive view of things. Origen (2nd-3rd cent.) and Augustine (4th-5th cent.) will be studied as influential formulators of the Eastern and Western Christian traditions respectively.

Spring semester. Mr. Henry.

105. The Idea of God in Western Thought. An examination will be made of writings which have contributed most to Western concepts of God. The study will include Plato, Aristotle, the Bible, Athanasius, Augustine, Thomas Aquinas, Luther, Calvin, Kant, Schleiermacher, Rudolf Otto, John Baillie, and others.

Spring semester. To be offered 1972-73. Mr. Urban.

106. Contemporary Religious Philosophers. The seminar will concentrate on representative thinkers and schools of thought in the present century. These will include Karl Barth, Martin Buber, Rudolph Bultmann, Reinhold Niebuhr, Paul Tillich, and others.

Fall semester. Mr. Urban.

107. Topics in the History of Religions. A study of particular topics in the history of religions such as myth, mysticism, cultus, ethics.

To be offered 1972-73.

108. Studies in Hinduism and Buddhism. A seminar designed to treat special topics in Hinduism and Buddhism depending on the interest and needs of students in the field of the History of Religions. Possible subjects of interest might include idealistic thought in Hinduism and Buddhism, facets of Buddhism in China and Japan, or the historical and cultural interactions of Hinduism and Buddhism in South Asia. Topic for 1971-72: Idealistic Thought in India.

Spring semester. Mr. Swearer.

110. Medieval Philosophy. Philosophical thought from Augustine to the 15th century. Attention will be paid both to specific problems such as universals, analogy, and epistemology and to outstanding thinkers such as Anselm, Aquinas, Scotus and Ockham. Although primary emphasis will be historical, attention will be paid to the contemporary relevance of medieval thought. (Also listed as Philosophy 110.)

Fall semester. To be offered 1972-73. Mr. Urban.

111. Philosophy of Religion. See Philosophy 111.

Fall semester. Mr. Bennett.

112. Sociology of Religion. See Sociology and Anthropology 107.

Spring semester. Mr. Piker.

120. Thesis. Honors students who choose to do so will customarily write theses during the senior year. Students are urged to have thesis proposals approved as early as possible during the junior year.

Members of the Department.

SOCIOLOGY AND ANTHROPOLOGY

LEON BRAMSON, *Professor and Chairman*†

STEVEN PIKER, *Associate Professor**

JAMES BROW, *Assistant Professor*

ROBERT C. MITCHELL, *Assistant Professor**

HANS-EBERHARD MUELLER, *Assistant Professor*

JENNIE-KEITH ROSS, *Assistant Professor*

JON VAN TIL, *Assistant Professor*

Although Sociology and Anthropology arose initially out of divergent historical traditions, they are engaged in a common task. Studies in the department are directed toward the discovery of the general principles which help to explain the order, meaning, and coherence of human social and cultural life. To that end, work in the department will emphasize the comparative analysis of societies and social institutions; the structure and functioning of human communities; the principles of social organization and disorganization; and the conditions which tend to foster continuity and change, consensus and conflict. Emphasis will also be laid on the relevance of Sociology and Anthropology to social problems in the modern age, particularly to the question of the nature, conditions and limits of human freedom.

REQUIREMENTS AND RECOMMENDATIONS

Course 1 is prerequisite to all other work in the department. Applicants for a major or minor are required to have taken one additional course. Course majors will customarily write a thesis in their senior year. Course majors will take a minimum of eight courses in the department, including the introductory course and Course 98-99 (thesis). In general, students who take a course may not take the corresponding seminar.

1. Introduction to Sociology and Anthropology. An exploration of human societies and cultures: the origin of culture, its acquisition by the individual, and the diversification of societal types. Topics to be studied comparatively will include: human evolution, urbanism, ethnic and cultural pluralism, and social change.

Fall semester. Members of the department.

20. Methods of Social Research. An introduction to the empirical study of societies. Topics for study include: the philosophical basis of social inquiry, the design of social research, problems of sampling, measurement, statistical analysis, data collection and interpretation. Special attention is given to survey research, participant observation, and the use of the computer in social research. The major portion of class work consists of lab assignments, including field work. This course presupposes no particular mathematical background, and is especially recommended to sophomores or juniors who plan to undertake empirical research for their theses.

Spring semester. Mr. Mitchell.

†Absent on leave, spring semester, 1971-72.

*Absent on leave, fall semester, 1971-72.

SOCIOLOGY AND ANTHROPOLOGY

21. African Modernization. A survey of modernization theory and the modernization process in Africa south of the Sahara, including indigenously induced pre-colonial change, the impact of the West on African traditional societies, the changes associated with nationalism and independence, and the impact of urbanization and industrialization. Attention will be given to the uniquely African aspects of modernization with special reference to modern African culture. Selected countries will be examined intensively.

Fall semester. To be offered in 1972-73. Mr. Mitchell.

22. Race and Ethnic Relations in the United States. Ethnic and minority relations in America, their structure and patterns of change. Particular emphasis will be placed on the American Negro: the development of subcultures, effects of racial discrimination on the individual, and social movements arising out of the acculturation process. The experience of other ethnic groups, the melting-pot thesis, and the persistence of religious subcultures will also be studied.

Not offered in 1971-72. Mr. Van Til.

23. Comparative Social Organization. Examines the ways in which anthropologists and sociologists have tried to comprehend the variety of human societies. Such concepts as structure, function, process, and evolution are considered in their social application. Particular attention is paid to non-Western social systems in which kinship is a pervasive regulating principle in political, economic and ritual organization, as well as in domestic affairs.

Spring semester. Mr. Brow.

26. Language, Society and Culture. The relationship of language to culture and society will be investigated through study of the influence of social and cultural context on language use, the distribution of linguistic, social, and cultural borders in speech communities, and the interrelationship of the participants, topics, setting, code and communication channels in the speech event. Specific topics will include multi-lingualism, nonverbal communication, and linguistic relativity. Students will do several short observation projects in these areas.

Spring semester. To be offered in 1972-73. Mrs. Ross.

29. Sociology of Religion. Also listed as Religion 29. Examination of the relationship between religion and society. Sociological theories of religion, religious organization and behavior, religion and social change, processes of institutionalization and secularization.

Not offered in 1971-72.

40. Man and Environment. Consideration will be given to the methodology of ecological analysis and its application to the study of the causes and consequences of the growth of technology and human populations, especially in relation to the question of environmental deterioration. An attempt is made to synthesize approaches and information from various disciplines within the social and natural sciences. (Also listed as Biology 40.)

Prerequisite: Completion of distribution requirement in Groups 1 and 4.

Spring semester. Mr. Hickman and Mr. Mitchell.

50. Modern Social Theory. The social and intellectual background of the rise of social science, with consideration of selected social theorists and emphasis on the relation of ideology to theory and research in sociology. Among theorists who will be considered are St. Simon, Comte, Durkheim, Marx, Weber, Simmel, Veblen, Mannheim, and Freud.

Fall semester. Mr. Bramson.

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51. Caribbean Society. A review of the attempt to develop generalizations about the structure of Caribbean society. Theoretical materials will focus on the historical role of slavery, the nature of plural societies, race, class, ethnicity and specific institutions such as the family, the school, the church, and the political structure.

Not offered in 1971-72. Mr. Bramson.

57-8. Colloquium: Social Borders. This course will try to define the processes by which basic social characteristics such as age, sex, or ethnicity become identified and maintained as social borders which define groups, roles, and conflicts in both traditional and industrial societies.

Spring semester. Mrs. Ross.

59. Urban Sociology & Politics (cross-listed as Political Science 10). Particular emphasis will be placed on the politics and sociology of the contemporary American city, and upon aspects of urban society that relate especially to racial and economic segregation. The course will examine the way in which urban social problems become defined and major alternative approaches toward the resolution of these problems. This course is required for students who wish to take Problems in Urban Education (Political Science 12) and/or Problems in Urban Housing (Sociology-Anthropology 59A, cross-listed as Political Science 11.)

Spring semester. Mr. Cottingham and Mr. Van Til.

59A. Problems in Urban Housing (cross-listed as Political Science 11). This course provides a policy orientation toward housing, both in its environmental and social scientific aspects. Coordinated student research projects will address the way in which housing problems become defined and paths toward the resolution of these problems. Special emphasis will be placed on ways in which technological and political solutions may be jointly developed toward the resolution of housing problems. Students who take this course are required to take the course Urban Sociology and Politics concurrently.

Spring semester. Mr. Van Til and Mr. Willis.

61. Social Stratification. Examination of theories and empirical studies of structured social inequality and processes of class formation in historical and contemporary societies. Special emphasis will be placed on stratification in contemporary American society. The range of topics varies from year to year, but might include poverty and income distribution, the structure of power, class subcultures and styles of life, deviance and delinquency, ethnic stratification, and social mobility.

Spring semester. Mr. Mueller.

62. Political Sociology. (Also listed as Political Science 62.) Sociological analysis of political elites, politics, and political institutions in comparative-historical perspective. Although the major focus will be on modern societies, a part of the course will be devoted to pre-modern, primarily medieval European, conditions and the rise of the modern nation-state. Particular emphasis will be given to theories and empirical studies of various types of protest movements in historical and contemporary societies.

Fall semester. Mr. Mueller.

63. Psychological Anthropology. The relationship between the psychological attributes of individuals and the workings of institutions and societies. The course examines the following specific issues: the evolution of the psychological and symbolic capacities which underlie culture; socialization, or the transmission of

SOCIOLOGY AND ANTHROPOLOGY

culture from generation to generation; theoretical viewpoints on the individual in society; culture and mental health. Case materials drawn from non-Western cultures as well as the West.

Prerequisite: Sociology and Anthropology 1, or introductory level work in Psychology, or permission of instructor.

Spring semester. Mr. Piker.

64. Theravada Buddhism: A Social History. The course will take up the following issues: 1) the cultural and historical context in which Buddhism emerged in India 2500 years ago; 2) classical Theravada doctrines, and their correlates in contemporary religious institutions in Theravada societies; 3) the juxtaposition of Buddhist and non-Buddhist religious elements in Theravada societies; and 4) the reciprocal relationship between Buddhism and social and political change in contemporary SE Asia. (Also listed as Religion 13.)

Fall semester. To be offered in 1972-73. Mr. Piker.

66. 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.

67-8. Colloquium: Human Resources. A research colloquium emphasizing the study of the intersection of the educational system and the occupational structure. Specific problems will include improvement of the educational system, military manpower policy, the human career, and professionalization. Each member of the colloquium will do a project.

Not offered in 1971-72. Mr. Bramson.

70. Economic Anthropology. Analysis of economic organization, the forms and quality of economic action, and relations between economic and other institutions in primitive and peasant societies. Examines societies as systems of exchange and as adaptations to their natural and cultural environments.

Spring semester. Mr. Brow.

71-2. Colloquium: The Sociology of Intellectual Life. An examination of the main approaches to the sociological study of culture and intellectual life. Particular attention will be given to the role of intellectuals in modern society. The colloquium will provide an opportunity for research on the sociology of science, literature, art, and music.

Spring semester. Mr. Mueller.

74. 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, such as a Bushman band, an American Indian tribe, a French village, and a Boston ward.

Spring semester. To be offered in 1972-73. Mrs. Ross.

75. Education and Society. Comparative study of the functions of schools from the perspectives of sociology and anthropology. Among the topics to be discussed are the relationship of educational institutions to other sectors of society, and the question of alternatives to schooling in both modernizing and "post-industrial" societies.

Fall semester. Mr. Bramson.

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98-99. Thesis. Theses will be required of all Course majors. Seniors will normally take two consecutive semesters of thesis tutorial (Course 98-99) during their senior year. Students are urged to have their thesis proposals approved as early as possible during the junior year.

Members of the department.

HONORS SEMINARS

102. Comparative Social Organization. Examines the ways in which anthropologists and sociologists have tried to comprehend the variety of human societies. Such concepts as structure, function, process, and evolution are considered in their social application. Particular attention is paid to non-Western social systems in which kinship is a pervasive regulating principle in political, economic and ritual organization, as well as in domestic affairs.

Spring semester. Mr. Brow.

103. Race and Culture. A comparative study of the patterns of ethnic and minority relations in society, with consideration of the factors underlying persistence and change. Race and culture will be related through an examination of conflicts of values, social hierarchies, and the maintenance of subcultures.

Not offered in 1971-72. Mr. Van Til.

104. Psychological Anthropology. The significance of psychological theories for the analysis of social and cultural systems. Special emphasis will be given to personality and social structure, religious belief systems, and comparative socialization within a variety of cultural settings.

Spring semester. Mr. Piker.

105. Modern Social Theory. The social and intellectual background of the rise of social science, with consideration of selected social theorists and emphasis on the relation of ideology to theory and research in sociology.

Spring semester. Not offered in 1971-72. Mr. Bramson.

107. Sociology of Religion. Also listed as Religion 112. An exploration of the relationship between religion and society. Special emphasis will be given to the social and historical determinants of changes in religious institutions, and to the adaptive qualities of religious institutions in periods of social upheaval. Case materials will be drawn largely from societies and religions of South and Southeast Asia, principally Hinduism and Buddhism. Work in the seminar will include a research project.

Spring semester. Mr. Piker.

108. Social Stratification. Examination of theories and empirical studies of structured social inequality and processes of class formation in historical and contemporary societies. Special emphasis will be placed on stratification in contemporary American society. The range of topics varies from year to year, but might include poverty and income distribution, the structure of power, class subcultures and styles of life, deviance and delinquency, ethnic stratification, and social mobility.

Spring semester. Mr. Mueller.

109. Social and Cultural Change. Classical and modern theories of change. Case studies of long term and short term aspects of change, including the industrial revolution, the modernization process, collective behavior, and aspects of contemporary and future American society.

Fall semester. To be offered in 1972-73. Mr. Mitchell.

SOCIOLOGY AND ANTHROPOLOGY

111. Urban Sociology. The historical growth of cities, the social structure of urban areas, impact of urbanization on social relations, and the emergent ideologies of city life considered from the main perspectives of urban sociology. Topics of special interest include the structure and process of metropolitan life, the consequences of urbanization for rural life and small towns, the prospects for urban planning, and the contemporary crisis of the cities.

Fall semester. Mr. Van Til.

112. Sociolinguistics. The influence of social and cultural context on language use will be investigated, with special emphasis on multilingualism, creoles and pidgins, language standardization and planning, and the interrelationship of participants, topics, setting, code and communication channels in the speech event.

Fall semester. Mrs. Ross.

114. Political Sociology. Sociological analysis of political elites, politics, and political institutions in comparative-historical perspective. Although the major focus will be on modern societies, some time will be devoted to premodern, primarily medieval European, conditions and the rise of the modern nation-state. Particular emphasis will be given to theories and empirical studies of various types of protest movements in historical and contemporary societies.

Fall semester. To be offered in 1972-73. Mr. Mueller.

120. Thesis. Honors students 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.

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FACULTY

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Avery, Brodhead, di Franco, Gaty, Gleitman, Govan, Mullins, Rosenberg,
Weiss, J. Williams.
- Use of College Facilities by Outside Organizations: Cook, *Chairman*.
Flemister, Hess, Shane, Skeath, Stanton, Stetson.

Divisions and Departments

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Susan B. Snyder, *Chairman*.

- Art, John W. Williams, *Chairman*.
Classics, Martin Ostwald, *Acting Chairman*.
English Literature, Harold E. Pagliaro, *Chairman*.
History, Harrison M. Wright, *Chairman*.
Mathematics, Eugene A. Klotz, *Acting Chairman*.
Modern Languages, Francis P. Tafoya, *Chairman*.
Music, Peter Gram Swing, *Chairman*.
Philosophy, Charles Raff, *Acting Chairman*.
Psychology, Kenneth J. Gergen, *Chairman*.
Religion, P. Linwood Urban, *Chairman*.

II. DIVISION OF THE SOCIAL SCIENCES

James A. Field, Jr., *Chairman*.

- Economics, Frank C. Pierson, *Chairman*.
Engineering, Samuel T. Carpenter, *Chairman*.
History, Harrison M. Wright, *Chairman*.
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Philosophy, Charles Raff, *Acting Chairman*.
Political Science, David G. Smith, *Chairman*.
Psychology, Kenneth J. Gergen, *Chairman*.
Sociology and Anthropology, Leon Bramson, *Chairman*.

III. DIVISION OF THE NATURAL SCIENCES AND ENGINEERING

Olexa-Myron Bilaniuk, *Chairman (fall semester)*

David L. Bowler, *Chairman (spring semester)*

- Astronomy, Peter van de Kamp, *Chairman*.
Biology, Norman A. Meinkoth, *Chairman*.
Chemistry, Peter T. Thompson, *Acting Chairman*.
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Mathematics, Eugene A. Klotz, *Acting Chairman*.
Philosophy, Charles Raff, *Acting Chairman*.
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Virginia E. Myers, Willets Hall.

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Anne Perkins; **Pauline Marshall**, B.S., Simmons College; **Ethel N. Wright**, Assistants, Serials Section.

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Sylvia L. Haviland, B.A., Goddard College, Assistant.

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Judy Grace Feiy, **Helen Burgoyne**, **Dorothy H. Olson**, Switchboard Operators.

Arlene Delozier, Postmistress.

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Joseph E. Spafford, B.S., University of Missouri, Planning Engineer.

Franklin H. Briggs, B.A., Earlham College; **Richardson Fields**; **David Melrose**; **Harold Hofman**; **Henry Peirsol**, **William Grohol**, Assistants to the Director of Physical Plant.

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Francis Kavanaugh, Margaret R. Shaw, Sarah Hastings, Rosalie F. Maller, Secretaries.

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Joseph W. Oppe, B.S., Marietta College; M.S., University of Idaho, Director of the Arthur Hoyt Scott Horticultural Foundation and Swarthmore College Horticulturist.

David Melrose, Assistant Director.

Gaye Parsio, Secretary.

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Mary C. Kasper, Alumni Recorder.

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Mildred Strain, Secretary.

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Judith Kapustin Katz, B.A., Temple University; M.A., University of Michigan, Director.

Josephine Booth, Secretary.

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Harold C. Roxby, B.S., Pennsylvania State University; M.D., Temple University, College Physician.

Erwin R. Schmidt, Jr., B.S., Yale University; M.D., University of Wisconsin, Consulting Orthopedic Surgeon.

Consulting Psychiatrists:

J. W. Lyons, B.A., University of Scranton; M.D., University of Pennsylvania.

Donald V. Stevenson, B.A. and M.D., Universidad de Cartagena.

Silas L. Warner, B.A., Princeton University; M.D., Northwestern University.

ADMINISTRATION

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**Elizabeth Cozine, R.N., E. Elizabeth McGeary, R.N., Helen R. Martin, R.N.,
Joan Morton, R.N., Ida Moore Thomas, R.N.
Janet B. Hazzard, R.N., Secretary.**

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Art: **Wallace C. Ayres, B.A., Swarthmore College, M.Ed., Harvard University,
Linda Rabben.**

Astronomy: **Mary MacD. Jackson, B.A., Swarthmore College; Nan Jones;
Elizabeth H. Kuhlman, B.A., Mount Holyoke College; Louise H. Mitchell,
B.S., West Chester State College; Michael D. Worth, A.A., Keystone Junior
College.**

Biology: **Lloyd Merritts; Otto Hebel, James H. Draper, III.**

Chemistry: **Ursula M. Davis, B.S., MT (ASCP) Colby Junior College; Jacqueline
Bray; Edward C. Kehl; Margaret Lehman, B.A., Swarthmore College.**

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Economics: **Eleanor Greitzer; Mary E. Renneisen.**

Education: **Janice DeAncona.**

Electronics Technician: **John J. Dougherty.**

Engineering: **Frances Shero, B.A., Swarthmore College; Theodore T. Bartholo-
mew; Josephine Booth; T. F. Hockman.**

English Literature and Division of the Humanities: **Thelma M. Miller.**

History: **Eleanor W. Bennett.**

Linguistics: **Joan Linn.**

Mathematics and Division of the Social Sciences: **Dorothy D. Blythe.**

Modern Languages: **Martha Dieffenbach; Natalie Kruczaj.**

Music: **Mary G. Gatens.**

Philosophy: **Alta K. Schmidt.**

Physical Education for Men: **Elizabeth Bassett.**

Physical Education for Women: **Esther R. Gosser.**

Physics: **John R. Andrews; Anna V. DeRose.**

Political Science: **Eleanor Greitzer; Mary E. Renneisen.**

Psychology: **Virginia S. Greer; Otto Hebel.**

Religion: **Alta K. Schmidt.**

Sociology and Anthropology: **Pauline B. Federman; Marie C. Perkins.**

ADMINISTRATIVE

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VII

VISITING EXAMINERS

DEGREES CONFERRED

AWARDS AND DISTINCTIONS

ENROLLMENT STATISTICS

PLAN OF COLLEGE GROUNDS



Commencement in the Scott Auditorium

VISITING EXAMINERS 1971

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ASTRONOMY: Dr. James Franklin Wanner, *U. S. Naval Observatory*.

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DEGREES CONFERRED

June 7, 1971

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- | | |
|---|--|
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| Martha Leigh Aldrich, <i>Art History</i> | Catherine Felicie Caufield,
<i>Sociology-Anthropology</i> |
| Margaret Reece Allen, <i>French</i> | Robert Scott Chase, <i>Economics</i> |
| Barbara Albert Atkin, <i>History</i> | Robert Bennett Clark, <i>Zoology</i> |
| Jean-Marie Prestwidge Barch,
<i>English Literature</i> | Peter Tristram Coffin, <i>Zoology</i> |
| Steven Jack Bardwell, <i>Physics</i> | Susan Cohen, <i>English Literature</i> |
| Linda Ann Barrett, <i>English Literature</i> | Constance Hamilton Cole,
<i>Political Science</i> |
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| Peter David Bell, <i>Psychology</i> | Patrick Connell, Jr., <i>English Literature</i> |
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<i>English Literature</i> | Peter Grotjan Cook,
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| Betty Katherine Bird, <i>History</i> | Peter Claver Costello, <i>History</i> |
| Faith Adele Blakely, <i>Biology</i> | Linda Mae Cox,
<i>Sociology-Anthropology</i> |
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<i>English Literature</i> | Robert Michael Cushman, <i>Zoology</i> |
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<i>Music and Philosophy</i> |
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| David Marius Bressoud, <i>Mathematics</i> | Craig Richardson DeSha,
<i>English Literature</i> |
| Robert Smedley Briggs, <i>Economics</i> | Paul Joseph DiMaggio,
<i>Sociology-Anthropology</i> |
| Phyllida Faulkner Brown,
<i>English Literature</i> | Carmelita Ann DiMichael, <i>Psychology</i> |
| Stephen Jay Burns, <i>Physics</i> | |
| John Hillyard Burton, <i>Economics</i> | |
| Elliot Cardozo Carlen, <i>Mathematics</i> | |
| Monica Anne Carsky, <i>Psychology</i> | |

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 Susan Leigh Foster,
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 Carol Anne Freed, *Zoology*
 Nancy Galbraith*, *English Literature*
 Peter Howard Gann, *Biology*
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 Barbara Brownlee Gibson, *Zoology*
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 Richard Edwin Hegner,
Political Science
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 William Reinhardt Kennedy*,
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 Steven James Kerr, *Mathematics*
 Kathryn Ann Knight, *Psychology*
 Kim Irene Koch, *English Literature*
 Douglas Robert Komer,
Political Science
 Francesca McCormick Kress,
Sociology-Anthropology
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 Judith Cutright Larrimore, *Philosophy*
 Jonathan Reiner Lax,
Sociology-Anthropology
 Frederick M. Leader,
Economics and Mathematics
 Jonathan P. Levin, *Philosophy*
 Paula Frances Levin, *Psychology*
 Edward Harrison Levy,
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 Katherine Joan Little, *Biology*
 Stephen Taylor Lowe, *Biology*
 Anne Cathell Lowry,
Sociology-Anthropology
 Barbara J. Mahl, *French*
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Martha Lynn Meier, *Political Science*
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Kenneth Miller, *Sociology-Anthropology*
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Scott Minor, *History*
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Susan Elizabeth Morrison, *History*
Teru Linnea Morton, *Sociology-Anthropology*
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Nicholas Reynolds, *History*
Donna Ellen Richardson, *English Literature*
Judith Ann Richardson, *English Literature*
Deborah Hathaway Roberts, *Greek*
Nancy Laurie Roberts, *English Literature*
Holly Lynn Robinson‡, *Religion and Sociology-Anthropology*
John Gwilym Robinson, *Zoology*
Steven Thomas Roens, *Sociology-Anthropology*
Rebecca Sarah Rothenberg*, *Sociology-Anthropology*
Pamela Rose St. John, *Chemistry*
Marcia Satterthwaite, *English Literature*
Richard Miller Schall, *Philosophy*
Robert M. Scheiber, *English Literature*
David Jay Scheidlinger, *Biology*
Eleanor Margaret Schmidt, *History*
Susan Jane Schug, *English Literature*
Sheryl Edith Sebastian, *Psychology*
Thomas Randolph Selden, *Music*
Geoffrey Selling, *Ancient History*
Charles Alben Shapiro, *Sociology-Anthropology*
H. Alan Shapiro, *Greek*
Paul Lewis Shechtman, *Economics*
Sarah Worthington Shepard, *English Literature*
Bruce Shigeura, *Philosophy*
Nancy Ellen Shoemaker, *Mathematics*
Glenn Norman Siegel, *Biology*
Joanne Simboli, *History*
David Lee Slansky, *Political Science*
H. Royer Smith, III*, *Psychology*
Jenny Fong-suk So, *English Literature*
Jeffrey Spielberg, *Art History*
Constance Vibeke Strand, *Sociology-Anthropology and Zoology*
Julia C. Struble, *English Literature*
Adrienne Sutton, *French*

DEGREES CONFERRED

- Mabry Chambliss Swanson, *Latin*
Daniel McKay Taylor,
English Literature
Susan Elizabeth Taylor, *Psychology*
Alan Forrest Thomas, *Mathematics*
Charles Stephen Thomforde, *Biology*
Scott McClain Thompson, *Psychology*
Christine Louise Tolins, *Biology*
Ralph Worthen Tryon, *Economics*
Mary Stott Tyler, *Biology*
Marc Stuart Walter, *Psychology*
Jonathon David Warner,
Political Science
Daniel M. Wasserman, *Philosophy*
Nathan Wei, *Zoology*
William Pierce Welch, *Economics*
Susan Scott Welsh,
Psychology and Russian
Marc J. Wertheimer, *Zoology*
- Randy Fair Wertheimer, *Art History*
Lynnea Christine West, *Biology*
Deborah Whittle, *French*
F. Frank Wiedemann,
English Literature
Charles Edward Williams, Jr.
Mathematics
Wendy L. Wintermute,
Sociology-Anthropology
Marie Jane Witwicki,
Sociology-Anthropology
Richard Emerson Wolfe, *History*
M. Elisa Wright, *English Literature*
Guy Moulton Yates, *Mathematics*
Susan Aviva Yelsey,
Sociology-Anthropology
Bertrand R. Yourgrau*,
English Literature

BACHELOR OF SCIENCE

- Robert Leonard Abrahams,
Engineering
John Charles Baer, *Engineering*
Richard Walden Beatty, *Engineering*
Bryan William Butler, *Engineering*
Sylvia Jean Chin, *Engineering*
- Alexander Phillip Cilento, *Engineering*
Jairo A. Correa G., *Engineering*
Benjamin L. Liu, *Engineering*
J. Denis Newbold, *Engineering*
Robert John Osborne, *Engineering*
Charles Alben Shapiro, *Engineering*

MASTER OF ARTS

- Michael Allen Boni, *Psychology*
Kyongae Chang, *Astronomy*
- Phyllis Hall Raymond, *Political Science*

HONORARY DEGREES

DOCTOR OF HUMANE LETTERS

Russell Meiggs

DOCTOR OF LAWS

Henry S. Reuss

†As of the Class of 1969.

*As of the Class of 1970.

‡With concentration in Black Studies.

AWARDS AND DISTINCTIONS

HONORS AWARDED BY THE VISITING EXAMINERS

HIGHEST HONORS:

William A. Dellalfar, Kenneth A. Oye.

HIGH HONORS:

Steven J. Bardwell, Linda M. Cox, Kenneth P. Giles, David R. Goodrich, Steven D. Gordon, Edward H. Levy, Maurice J. Martin, Martha L. Meier, Cheryl W. Mitchell, Carol Pixton, Martin S. Putnam, Nicholas Reynolds, Deborah H. Roberts, Paul L. Shechtman, Nancy E. Shoemaker, Jenny F. So, Susan E. Taylor, Susan A. Yelsey.

HONORS:

Linda A. Barrett, Thomas J. Bates, Peter D. Bell, Monica A. Carsky, Constance H. Cole, Paul J. DiMaggio, William B. Evans, Gail L. Foster, Jane M. Fraser, R. Scott Hardwig, Richard E. Hegner, Carl D. Holzman, Elaine D. Kuehn, John N. Mayberry, Donna E. Richardson, Judith A. Richardson, Nancy L. Roberts, John G. Robinson, David L. Slansky, Daniel M. Taylor, Ralph W. Tryon, Jonathon D. Warner, Deborah Whittle, Wendy L. Wintermute.

DISTINCTION IN COURSE AWARDED BY FACULTY

Marianne Louise Albertson, Margaret Reece Allen, Barbara Albert Atkin, Catherine Felicié Caufield, Robert Bennett Clark, Robert Michael Cushman, Carmelita Ann DiMichael, Antoinette Maria LaP. Flowers, Carol Ann Hartnett, Robert Earl Heinaman, Karen Seager Hoe, Barbara Walrath Hunter, David Champion Huntington, David William Inouye, Jonathan Reiner Lax, Frederick M. Leader, Paula Frances Levin, Katherine Joan Little, Steven Michael Melov, Teru Linnea Morton, David Jay Scheidlinger, Sheryl Edith Sebastian, H. Alan Shapiro, Constance Vibeke Strand, Mary Stott Tyler, Marc J. Wertheimer.

ELECTIONS TO HONORARY SOCIETIES

PHI BETA KAPPA

Margaret Reece Allen, Barbara Albert Atkin, Steven Jack Bardwell, Monica Anne Carsky, Robert Bennett Clark, William Abdollah Dellalfar, Jane M. Fraser, Kenneth P. Giles, David Raymond Goodrich, Steven Douglas Gordon, Richard Edwin Hegner, Robert Earl Heinaman, Barbara Walrath Hunter, Jonathan Reiner Lax, Paula Frances Levin, Edward Harrison Levy, Katherine Joan Little, Martha Lynn Meier, Steven Michael Melov, Cheryl Warfield Mitchell, Kenneth Akito Oye, Carol Pixton, Nicholas Reynolds, Deborah Hathaway Roberts, David Jay Scheidlinger, H. Alan Shapiro, Paul Lewis Shechtman, Nancy Ellen Shoemaker, Jenny Fong-suk So, Susan Elizabeth Taylor, Marc J. Wertheimer, Deborah Whittle, Susan Aviva Yelsey.

SIGMA XI:

Steven J. Bardwell, Kyongae Chang, Sylvia J. Chin, Robert B. Clark, Jane M. Fraser, Geoffrey L. Greene, David W. Inouye, Benjamin L. Liu, J. Denis Newbold, Nancy E. Shoemaker.

SIGMA TAU:

Sylvia J. Chin, Benjamin L. Liu, J. Denis Newbold, Charles A. Shapiro.

AWARDS AND DISTINCTIONS
SWARTHMORE COLLEGE FELLOWSHIP AWARDS

- The Hannah A. Leedom Fellowship* to KATHLEEN L. DAERR.
The Joshua Lippincott Fellowship to NICHOLAS REYNOLDS.
The Lucretia Mott Fellowship to SHERYL SEBASTIAN, DEBORAH ZUBOW.

SPECIAL AWARDS

- The Ivy Award* to Paul Shechtman.
The Oak Leaf Award to Dorothy Goggin.
The McCabe Engineering Award to J. Denis Newbold.
The Sarah Kaighn Cooper Scholarship to Ernest B. Abbott.
The Phi Beta Kappa Prize to John A. Goldsmith
The Brand Blanshard Prize to John R. Satterfield, III.
The Ella Frances Bunting Poetry Reading Contest: first prize, Betty M. McElrea;
second prize, Dennis A. Small; third prize, Deborah Zubow.
The William Plumer Potter Public Speaking Fund Awards:
The Potter Fiction Contest: first prize, James R. Thorpe; second prize, William
H. Eilberg; third prize, Marc S. Walter.
The Lois Morrell Poetry Prizes: first prize, William P. Yarrow; second prize,
Christine A. Wulfhorst.
The John Russell Hayes Poetry Prizes: first prize, Galip A. Ulsoy; second prize,
Randolph Lawlace.
The Academy of American Poets Award to William P. Yarrow.
The May E. Parry Memorial Award to Katherine J. Little.
The Scott Award to William B. Carr, Jr.

ENROLLMENT OF STUDENTS BY CLASSES 1970-71

	Men	Women	Total
Seniors	128	100	228
Juniors	154	114	268
Sophomores	183	157	340
Freshmen	171	136	307
Total Undergraduates	636	507	1,143
Graduate Students	2	3	5
Special Students	10	5	15
Totals	648	515	1,163

GEOGRAPHICAL DISTRIBUTION 1970-71

Pennsylvania	245	Idaho	1
New York	181	Nebraska	1
New Jersey	89	Oklahoma	1
Maryland	62	South Carolina	1
California	54	Virgin Islands	1
Connecticut	49	Total U.S.A.	1,097
Massachusetts	49	Canada	11
Ohio	45	England	5
Delaware	36	Hong Kong	5
Virginia	30	Thailand	5
Illinois	29	Italy	4
Florida	22	Brazil	3
North Carolina	15	Japan	3
Texas	15	Mexico	3
Indiana	13	Bermuda	2
Minnesota	12	Nigeria	2
District of Columbia	10	Saudi Arabia	2
Michigan	10	West Germany	2
Missouri	9	Australia	1
Vermont	9	Colombia	1
Washington	9	El Salvador	1
Iowa	8	Guatemala	1
New Hampshire	8	India	1
Rhode Island	8	Iran	1
Tennessee	8	Jamaica	1
Alabama	7	Kenya	1
Georgia	7	Korea	1
Wisconsin	7	Lebanon	1
Hawaii	6	Libya	1
Kentucky	5	Switzerland	1
Maine	5	Taiwan	1
Wyoming	5	Tanzania	1
Arkansas	4	Trinidad	1
Colorado	4	Turkey	1
Mississippi	4	Uruguay	1
New Mexico	4	Venezuela	1
Oregon	4	West Indies	1
Louisiana	2	Total from abroad	66
Puerto Rico	2	Grand Total	1,163
Arizona	1		

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Swarthmore College Campus





Key to the Map

- 1 Parrish Hall
- 2 Parrish Hall Annex
- 3 Du Pont Science Building
- 4 Hicks Hall
- 5 Bartol Foundation
- 6 President's House
- 7 Whittier House
- 8 Friends Meeting House
- 9 Arts Center
 - Pearson Theatre
 - Wilcox Gallery
- 10 Trotter Hall
- 11 Beardsley Hall
- 12 Martin Biological Laboratory and Animal Laboratory
- 13 Sharples Swimming Pool
- 14 Hall Gymnasium
- 15 Relief Map of Campus (Scott Building)
- 16 Scott Outdoor Auditorium
- 17 Sproul Observatory
- 18 Clothier Memorial
- 19 McCabe Library
- 20 Cunningham House
- 21 Bond Memorial and Lodges
- 22 Benjamin West House
- 23 Worth Health Center
- 24 Tarble Social Center

- 25 Sharples Dining Hall
- 26 Lamb-Miller Field House
- 27 Clothier Fields
- 28 Squash Courts
- 29 Barn
- 30 Service Building
- 31 Heating Plant
- 32 Cunningham Field
- 33 Tennis Courts
- 34 Proposed site of women's athletic facilities
- 35 Proposed site of music building
- 36 Proposed site of drama building
- 37 Proposed site of studio arts and gallery building
- 38 Robinson House—Black Cultural Center
- 39 Scott Horticultural Foundation Office
- 40 Lilac Collection
- 41 Peony Collection
- 42 Magnolias
- 43 Crabapples
- 44 Pinetum
- 45 Rhododendrons and azaleas
- 46 Dean Bond Rose Garden
- 47 Scott Foundation Nursery and test plots

Dormitories and Residences

- A Dana Dormitory
- B Hallowell Dormitory
- C Wharton Hall
- D Willets Dormitory
- E Worth Dormitory
- F Palmer Hall
- G Pittenger Hall
- H Roberts Hall
- J Ashton House
- K Woolman House
- L Mary Lyon Buildings
- M Professors' Houses
- N Employees' Houses

Fraternity Lodges

- a, b, c, d, and e

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