



Cornell
University

ANNOUNCEMENTS

College of
Arts and Sciences

1969-70

CORNELL UNIVERSITY ANNOUNCEMENTS

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Arts and Sciences

1969-70

Cornell Academic Calendar *

1969-70†

Registration, new students	Th, Sept. 11
Registration, old students	F, Sept. 12
Fall term instruction begins, 7:30 A.M.	M, Sept. 15
Midterm grade reports due	S, Oct. 25
Thanksgiving recess:	
Instruction suspended, 1:10 P.M.	W, Nov. 26
Instruction resumed, 7:30 A.M.	M, Dec. 1
Fall term instruction ends, 1:10 P.M.	S, Dec. 20
Christmas recess	
Independent study period begins	M, Jan. 5
Final examinations begin	M, Jan. 12
Final examinations end	T, Jan. 20
Intersession begins	W, Jan. 21
Registration, new students	Th, Jan. 29
Registration, old students	F, Jan. 30
Spring term instruction begins, 7:30 A.M.	M, Feb. 2
Deadline: changed or make-up grades	M, Feb. 9
Midterm grade reports due	S, Mar. 14
Spring recess:	
Instruction suspended, 1:10 P.M.	S, Mar. 28
Instruction resumed, 7:30 A.M.	M, Apr. 6
Spring term instruction ends, 1:10 P.M.	S, May 16
Independent study period begins	M, May 18
Final examinations begin	M, May 25
Final examinations end	T, June 2
Commencement Day	M, June 8
Deadline changed or make-up grades	M, June 15

* Students in the College of Arts and Sciences should see page 25 for "Important Dates 1969-70."

† The dates shown in the Academic Calendar are subject to change at any time by official action of Cornell University.

The courses and curricula described in this *Announcement*, and the teaching personnel listed therein, are subject to change at any time by official action of Cornell University.

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Cornell University

COLLEGE OF ARTS AND SCIENCES

The College of Arts and Sciences reflects the history and aims of the University itself. Purposeful and diverse, it is a liberal arts college, a university college, and a graduate school and research center. The role of the liberal arts college is traditionally and properly a double one. It should further a man's understanding of himself and the world he lives in. It should prepare him, if he has the desire and the talent, for further, more specialized study. All of the College's students have both opportunity and obligation to work toward that understanding; about two-thirds of its graduates continue their education.

The College of Arts and Sciences, in its second role as a university college, is responsible for the education of all Cornell students in liberal subjects. This is a taxing commitment, but a valuable one because meeting it helps to create and preserve a single academic community. At the same time, this obligation is also a source of strength and diversity that is not available to the single and solely undergraduate college. A university college, able to draw upon the more highly specialized knowledge and facilities of its more professional fellow colleges, is able to unite liberal and practical studies.

The College is also, and this is its third role, a graduate school and research institute. Teaching and scholarship are not separable activities. Their vigorous and inventive association provides inestimable advantages for undergraduates; it attracts fine minds to the faculty and keeps them professionally alert and humanly responsive; it demands first-rate facilities; and it creates an atmosphere of discovery and excitement.

This mixed character and these several functions are surely the most adequate way to meet the real obligations that higher education in America has assumed. In an American university each student must somehow receive an education which enables him to understand the world and effectively employ his talents in it; each must discover who he is and what his special interests and abilities are; each must be enabled to develop his knowledge, his interests, and his abilities; each must be helped to a sense of responsibility about himself and his work.

The College of Arts and Sciences thinks it can best meet these obligations by promoting diversity and permitting flexibility. For students this means freedom and continuity: freedom to experiment, to discover one's likes and talents, to change directions and correct mistakes; continuity so that experiment can take place without penalty, and with profit and excitement. Combination permits continuity; diversity permits freedom of education choice.

THE CURRICULUM

The College's curriculum gives the student opportunity for breadth, experiment, and discovery, especially during the first two years. A certain diversity is indeed urged upon him by the Distribution requirement itself. When the student explores a new subject matter he is, in effect, exploring his own latent interests and abilities. As he completes introductory courses the student lays the foundation for more advanced work or even for majoring in particular fields. During his fourth term (or earlier), as his interest comes to a focus, he chooses the subject in which he wishes to concentrate his study, aiming at depth and competence. The usual pattern is for him to devote roughly half the work of the last two years to his major program. Though certain core courses are usually prescribed in any major, there still remains a broad spectrum of choice which includes related courses in other subjects or even in other divisions of the University. Some departments offer two major programs: one, a program of intense and sophisticated preparation for postgraduate study; the other, a more general program for the person who wants a liberal education with some specific concentration, but whose interests are not professional.

Almost all departments have a full, demanding, and rewarding Honors program for those who demonstrate particular ability during their first two years. Many departments have as part of their Honors programs (or in addition to them) specially directed courses and projects which permit students to pursue their own interests and talents.

The College periodically offers experimental courses that cut across subject lines, explore new notions, and test ideas arising from that complicated triangulation that must go on between teacher, student, and subject.

ADMISSION

The College of Arts and Sciences attempts to select a freshman class whose members are individually able to take full advantage of the educational opportunities afforded by the College and the University. Because those opportunities are rich and diverse, no single criterion is employed. The College selects primarily for what Aristotle called the intellectual virtues, and it especially considers academic ability, intelligence and creativity, independence and maturity, and promise of

mental growth. It also seeks a class with a wide range of other qualities and characteristics, and it honors those young men and women with highly developed special interests and talents. Furthermore, the College is making a real effort to identify and admit students whose schooling and family backgrounds indicate that the standard measures are a poor index of their abilities.

An applicant must have completed a secondary school course giving satisfactory preparation for the work of the College. Sixteen units of entrance credit are required: four years of English; three years of college-preparatory mathematics (The increasing need for mathematics in the social, biological, and physical sciences makes it desirable for students interested in these areas to be prepared to take a calculus course upon entering the College; these students should have studied advanced algebra and trigonometry during their secondary school years.); and three years of one foreign language, ancient or modern. (Foreign language preparation is particularly important in this College. Although a student who can offer only two years or less of a foreign language, but who has a school record of otherwise high quality, should not hesitate to apply, he should attach a letter to his application form explaining his deficiency.) The remaining units should be chosen from laboratory science, social studies, and further work in mathematics and foreign language. Whenever possible, these sixteen units should be supplemented by courses in similar academic subjects. Exceptions to these requirements may be granted when the applicant's record is unusually promising. For example, students whose interests and academic and extracurricular achievements are in the fields of the creative and performing arts should not hesitate to apply because they have not taken a standard academic curriculum. Demonstrated unusual strengths in one area may offset weaknesses in another.

Each candidate for freshman admission is required to take the College Board Scholastic Aptitude Test and either the College Board Achievement Test in English composition or the College Board Literature Test no later than the January test date during his senior year. He is encouraged, but not required, to take other Achievement Tests of his choice. He should request the College Entrance Examination Board to send the results to the Office of Admissions, Cornell University.

Although an Achievement Test in language is not required for admissions consideration, a candidate should, before entering Cornell, take the College Board Achievement Test in any language which he has had in high school and expects to continue in the College. Because the score on such a test is needed for placement in language courses, the test should be taken late in the senior year—in March, May, or even July. A candidate should also keep in mind the further language requirement which he must meet by the end of his sophomore year in the College. If he will be entering with two or more years of some language which he wishes to use toward fulfilling this requirement (see p. 12.) he should also take the Achievement Test in that language even though he does not plan to continue it in college. This score

will determine whether in the tested language he has met part of the requirement for graduation.

Scores on these various admissions examinations provide no index at all for some qualities and only a rough index for others. But common sense suggests, and experience has shown, that high scores (above 700) tend to be linked with academic success and low scores (below 550) with academic risk in the College of Arts and Sciences.

An applicant for admission who has completed a year or more of work in another institution of recognized collegiate rank will be expected to have had preparatory work equivalent to that prescribed for freshmen. In addition, his progress in meeting the Distribution and language requirements will be carefully examined. Action on completed applications for transfer will be announced during April or early May. Transfer students should refer to the brochure "Transfer to Cornell University" for more complete instructions. A student seeking admission to the College of Arts and Sciences from some other undergraduate division of Cornell must first complete a year of successful study in that division.

Each year a few Special Students are enrolled in the College. These students must take at least twelve credit hours (e.g. four three-hour courses); they are limited to two terms of residence; they may not apply their courses toward an Arts College degree; and ordinarily they may not be studying *in absentia* from another college or university. Under special circumstances, students may spend their senior year at Cornell while earning the degree of another institution.

Special students must have a compelling academic reason for studying at Cornell and they must be endorsed by a member of the department in which they desire to concentrate their study.

Application forms may be obtained from the Office of Admissions, Day Hall, and all communications concerning admission should be directed there. Applications must be returned to the Office of Admissions by January 15.

For information on other matters of general interest such as details about health services and requirements, housing and dining services, tuition, fees, and living expenses, applications for financial aid, and motor vehicle regulations, consult the *Announcement of General Information*. The various *Announcements* of Cornell may be obtained by writing to the Announcements Office, Day Hall, Ithaca, New York 14850, or by inquiring at the administrative offices of the several colleges and schools.

Advanced Placement

Advanced placement and advanced placement credit toward the degree of Bachelor of Arts may be achieved by an entering freshman in a variety of subjects and in a variety of ways.

Advanced placement shall be awarded whenever a student's record, or

his examination scores, or both, indicate that he has earned it. Advanced placement credit shall be awarded only when it totals fifteen or more hours; in such cases the student shall have the option of accelerating one or two terms. It is not always wise to accelerate, and the student should consider his situation carefully, consult with his adviser, and present a coherent plan of study to the Dean's Office for approval. No credit towards graduation shall be allowed for amounts under fifteen hours except in certain, rare cases (such as illness or other necessary absence) when, with approval of the Dean's Office, advanced placement credit may be used to repair deficiencies. (For more information, see *Acceleration*, p. 17.) Advanced placement credit may be used to satisfy the Distribution requirements, but such use does not carry additional credit hours towards graduation. Essentially, advanced placement or credit represents a saving of time; consequently, it opens a number of possibilities. It may enable the student to broaden his education through a wider choice of elective courses. It may permit him to pursue his major more intensively and even to take graduate courses while an undergraduate. It may allow him at some point to lighten his formal course load in favor of informal or independent study. It may make it possible for him to graduate a term or even a year early.

Both advanced placement and advanced placement credit may be earned by high attainment on the College Board Advanced Placement Examinations in the following subjects: American history, biology, chemistry, European history, German literature, Latin, mathematics, Spanish literature, and physics. Also, advanced placement and advanced placement credit may be earned by high attainment on departmental examinations, given usually at entrance, in the following subjects: biology, chemistry, European history, mathematics, music, and physics.

In modern foreign languages, a student showing superior attainment on a College Board Language Achievement Test may be exempted from the three-hour requirement of advanced work after Qualification and receive three or six hours of advanced standing credit.

Placement and credit on the basis of the College Board Advanced Placement Examinations will usually be determined during the summer, and the student will be notified at registration so that he may make appropriate changes in his program of study. For students unable to take the College Board Advanced Placement Examinations, course examinations in some subjects will be offered at entrance (see the statements of the individual departments below). Freshmen desiring to take such examinations at the beginning of the fall term should be prepared to submit evidence of having completed courses conforming in substance and rigor with similar courses at the college level. Placement and credit will be determined as soon as practicable before course registration becomes final.

With a few exceptions, the awarding of credit in a subject is not conditional upon a student's continuing his study of that subject at Cornell. Although the credit is, in nearly all cases, recommended by the Faculty of the College of Arts and Sciences, it is recognized in any of the undergraduate divisions of the University.

BIOLOGICAL SCIENCES. A student who does not plan to major in biological sciences may satisfy Distribution requirements in biology with a score of 3, 4, or 5 on the College Board Advanced Placement Examination in biology or with a superior performance on a special departmental examination given at entrance. Before taking the latter examination, a student must consult with Professor W. T. Keeton (biology) and present evidence of particularly thorough training in the subject.

Prospective biological science majors (or other students planning to take advanced courses in this area) who achieve a score of 3 or 4 on the College Board Advanced Placement Examination in biology will be placed in a special honors section of Biological Sciences 101-102 and given work commensurate with their background. Students who receive a score of 5 will be given six hours of credit in biology and will be allowed to enter sophomore level courses (e.g. genetics) during their freshman year.

CHEMISTRY. The Department of Chemistry offers three two-term introductory sequences that satisfy prerequisites for further work in the Department—a six-hour sequence in general chemistry (Chemistry 103-104), a seven-hour sequence which includes qualitative analysis (Chemistry 107-108), and an eight-hour sequence which includes both qualitative and quantitative analysis (Chemistry 115-116). The college-level chemistry course offered by some secondary schools corresponds roughly to Chemistry 107-108. CBA and CHEMS are not considered sufficient preparation for advanced placement.

A freshman may qualify for advanced placement and seven hours credit for Chemistry 107-108 with a score of 5 or 4 on the Advanced Placement Examination in Chemistry or by passing a special examination available from the Department of Chemistry. Before taking the special examination, a student must consult with Professor M. J. Sienko (chemistry). A score of 3 on the Advanced Placement Examination earns six credit hours for Chemistry 103-104 and advanced placement in Chemistry 108.

ENGLISH. The Department of English will recommend six hours of advanced placement credit in English for qualified freshmen following their admission to Cornell and before they preregister for fall-semester courses. All students receiving advanced placement credit are also offered advanced placement in a variety of intermediate courses in English and American literature. (The student will, of course, receive advanced placement credit whether or not he elects to enter such a course.) The recommendation of advanced placement credit and advanced placement will be determined by as many of the following items of evidence as are available: the student's secondary school grades, including those in an advanced placement (often also termed *honors*, *enriched*, etc.) course in English; his scores on the College Board Advanced Placement Examination in English and on either the College Board English Composition or the College Board Literature Achievement Test; and his scores on the other tests normally required for admission.

A student who has not taken an advanced placement course in English or the College Board Advanced Placement Examination will nevertheless be considered for advanced placement credit and advanced placement.

HISTORY. The Department of History will recommend three hours of credit for History 106 for those entering students who receive a score of 5 or 4 on the College Board Advanced Placement Examination in European History. Students in Arts and Sciences who are recommended for credit may complete the Distribution requirement in history by taking History 105. Credit cannot be given for both semesters because the College Board Advanced Placement Examination does not include enough of the material covered in History 105.

The Department of History will recommend six hours of credit for History 215-216 (Survey of American History) for those entering students who receive scores of 5 or 4 on the College Board Advanced Placement Examination in American History.

Upon application from suitably prepared students who did not take the Advanced Placement Examination of the College Entrance Examination Board but who have superior records in secondary school and for their first semester's work in history at Cornell, the Department will also administer special examinations in February, covering the work of the second semester in the two courses named (106 and 216). Students who pass such an examination will receive credit for that semester.

Both of these courses are significantly different from courses with similar titles in secondary school. They differ in subject matter, in the use of sources, and in their emphasis on the use of the historian's skills and outlook. Therefore the student who intends to major in history or in the humanities or social sciences should take History 105-106 or History 215-216 as a preparation for upperclasswork. If he does so, he may receive credit for the course in addition to the advanced placement.

LANGUAGES. Since a usable command of a foreign language is considered an indispensable part of a liberal education, every student in the College of Arts and Sciences must achieve "Proficiency" in a single foreign language, or, alternatively, a somewhat lower level of "Qualification" in two languages, either classical or modern.

A. CLASSICAL LANGUAGES. The Department of Classics offers two-term sequences in Latin for freshmen at three different levels—for those who have had three or four years, two years, or no previous training in Latin. Qualification is established in Latin by passing Latin 107. Proficiency is established for those placed in Latin 107 by the completion of two three-hour courses beyond 107; for those placed in 201 by completing 201; those who are placed in 205 will be considered to have satisfied the language requirement. Placement in freshman Latin courses other than beginning Latin is determined by an examination administered by the Department of Classics approximately a week after the beginning of the fall term. Tentative placement is made on the basis of previous training: two units of entrance credit for Latin 107; three or four units of entrance credit for 201.

Entering freshmen who have passed the College Board Advanced Placement Examination in Latin 5 with a grade of 5 or 4 will be permitted to register for Latin 205, will be given six hours of college credit, and will be considered to have satisfied the language requirement. Entering freshmen who have passed the College Board Advanced Placement Examination in Latin 4 with a grade of 5 or 4 will be permitted to register for Latin 202 (offered spring term only), will be given three hours of college credit, and will be considered to have satisfied the language requirements for Arts and Sciences.

Qualification in Greek is established by passing Greek 103, proficiency by passing two three-hour courses beyond 103.

B. SEMITIC LANGUAGES AND LITERATURES. Students with at least three units of entrance credit in Hebrew may, upon examination by the Department or the presentation of equivalent evidence of competence (e.g., a grade of 90 or above on the Regents' examination), be admitted to Hebrew 204, satisfactory completion of which fulfills the language requirement of the College of Arts and Sciences for graduation.

Students with at least four units of entrance credit in Hebrew may be admitted to Hebrew 305 upon examination by the Department. Upon satisfactory completion of Hebrew 305, such a student may receive an additional three hours of advanced placement credit in Hebrew.

The language requirement of the College of Arts and Sciences can also be satisfied by the completion of Arabic 208. Advanced placement and advanced placement credit will be arranged for students who have had courses in Literary Arabic in accredited institutions before coming to Cornell.

C. MODERN FOREIGN LANGUAGES. Cornell offers two-semester intensive courses in the following languages: Burmese, Chinese, French, German, Hindi, Indonesian, Italian, Japanese, Portuguese, Russian, Sinhalese, Spanish, Telugu, Thai, and Vietnamese. "Qualification" in these languages is measured by examination and, for a student who begins work in a modern foreign language at Cornell, is normally attained after two intensive semester courses, amounting to twelve credit hours.

For any student at Cornell, placement in a modern foreign language which he has studied in secondary school is determined by his College Board Achievement Test. On this basis, a student may be declared "qualified" in a language at entrance. Once a student in Arts and Sciences has achieved qualification in a language (whether at entrance or later), he may then fulfill the language requirement of the college in either of two ways: (1) he may complete three additional hours in conversation courses or literature courses in the language, or (2) he may achieve qualification in a second foreign language.

Qualification upon entrance, or placement in a course intermediate between the elementary course and "qualification," does not constitute advanced placement. However, an entering student who shows superior attainment on the College Board Achievement Test may be eligible to

receive three or even six hours of advanced placement credit for work in intermediate conversation and composition. If he is granted at least three hours of advanced placement credit he will have thereby satisfied the language requirement for graduation. Entering students who may be entitled to such exemption will be notified of the fact; they must then be interviewed by a designated member of the Division of Modern Languages. Neither exemption nor advanced placement credit is achieved without this interview.

It is felt that a student working in French, German, Italian, or Spanish literature needs the thorough grounding in the literary techniques and maturing of critical judgments for which the introductory courses in these literatures are designed. However, students who demonstrate possession of these abilities can be granted advanced placement and advanced placement credit on the basis of an interview with a designated member of the department concerned. For additional information about language placement and requirements, see page 18.

MATHEMATICS. At all times a student at Cornell is urged to take the most advanced mathematics course for which he is prepared. If possible, *a secondary school student should take one of the two Advanced Placement Examinations of the College Entrance Examination Board in his senior year.* Students taking these examinations will automatically be offered advanced placement as follows.

Engineering students: A grade of 3 or higher on the AB examination, or of 2 or 3 on the BC examination will result in the offer of four hours advanced placement credit and placement into Mathematics 192. A grade of 4 or 5 on the BC examination will result in the offer of eight hours advanced placement credit and placement into Mathematics 293.

All other students: A grade of 3 on the AB examination will result in the offer of three hours of advanced placement credit and placement into Mathematics 112. A grade of 4 or 5 on the AB examination or of 2 on the BC examination will result in the offer of three hours advanced placement credit and placement into Mathematics 122. A grade of 3 on the BC examination will result in the offer of six hours advanced placement credit and placement into Mathematics 213. A grade of 4 or 5 on the BC examination will result in the offer of six hours advanced placement credit and placement into Mathematics 221.

There will be a placement examination in mathematics offered at Cornell just before the beginning of classes in the fall. Students placed in 112 who wish to enter 122, or those placed in 213 who wish to take 221 (see below), must take this examination. Students who did not take either one of the College Board Advanced Placement Examinations and want advanced placement and advanced placement credit, or who did take one and received less advanced placement than they think they should have, *must* take this examination in the fall of their freshman year. Experience has shown that many students who have not taken the Cornell placement examination or the College Board Advanced Placement Examination discover later that they already know all of Mathe-

matics 111 or 191 and want to change then. However, the Cornell placement examination is only offered once, at the beginning of the semester.

Students who have had the equivalent of at least one semester of analytic geometry and calculus are strongly urged to take a placement examination even if they feel their grasp of the material is uncertain; grades on these examinations do not become part of the student's record. The regular freshman calculus courses at Cornell do not differ substantially from calculus courses given in many high schools.

The following remarks do not apply to students taking the mathematics-for-engineers courses:

Although one year of mathematics is enough to satisfy the general distribution requirements of the College of Arts and Sciences, students who are likely to use mathematics in their further work will normally take four semesters of calculus and analytic geometry.

The higher level courses (122, 221, 222) should be elected by students of ability whose main interest lies in mathematics or physics. An exceptionally able student who cannot omit 122 may, with the permission of the Department of Mathematics, take 122 and 221 simultaneously in the first semester of the freshman year. Thus, if 222 is taken in the second semester of the freshman year, the student will have completed the sophomore course by the end of the first year.

A special sophomore year honors program consisting of Mathematics 221H-222H and Mathematics 411H-412H has been set up for the very best students, including those who may wish to do upperclass honors work in mathematics. Enrollment is strictly limited and is based on evidence of outstanding ability in mathematics. Students wishing to enter this course should consult a representative of the Mathematics Department. In particular, any student with a year or more of advanced placement credit who believes that he should take this course in his freshman year should see a member of the Department as soon as he arrives at the University.

MUSIC. Prospective freshmen and transfer students wishing to apply for advanced placement in music should consult the Chairman of the Department as early as possible, preferably concurrently with their applications for admission. Arrangements will then be made for a comprehensive examination in theory, administered by the Department of Music. Depending upon the results of this examination, the student's musical ability, and his background in music, a student may receive credit for Music 151, 151-152, or, in exceptional cases, Music 351-352. These courses in basic theory are required for the major in music, and they are prerequisites for most of the advanced music courses.

PHYSICS. Three different introductory physics courses are open to freshmen: Physics 101-102 (eight credit hours), 121-122 (six credit hours), and 207-208 (eight credit hours). Physics 101-102 has a prerequisite of three years of college-preparatory mathematics; and Physics 121-122 and 207-208 have an additional prerequisite of calculus or, for mathematically apt students, concurrent registration in calculus.

For Physics 207–208, a year of secondary-school Physics is a normal background but is not formally required. Physics 101–102 or 207–208 may be appropriately taken as a *terminal* physics course, but they are more significantly designed, especially 207–208 because of its mathematical level, to lead into other science courses or more advanced physics. (Another introductory course, Physics 201–202, is specifically for second- or higher-year college students who do not intend to major in a science; this course is not designed to prepare the student for any more advanced science course.) Physics 121–122 is specifically for freshmen students in Engineering; this course is the first of a two-year sequence.

Entering freshmen who have scored well on the College Board Advanced Placement Examination in Physics are considered for advanced placement and advanced placement credit in regard to Physics 101–102, 121–122, or 207–208, and occasionally in regard to just Physics 101 or 207. There are two levels of this College Board examination: with and without calculus; the examination level will determine the appropriate physics course for consideration. In addition, the Department of Physics administers each September (and also in June for Summer Session students) a special examination for suitably prepared students, especially for students who did not have the opportunity to take the College Board Advanced Placement Examination; suitable preparation is a second year of physics in secondary school; i.e., an “advanced placement” course or its full equivalent. On the basis of performance on either the College Board or the Departmental examination, the Department recommends advanced placement and advanced placement credit. It is not necessary for the student to continue the study of physics in order to qualify for this credit. In rare instances, a student who is not so recommended for credit may be allowed (but is not advised) to take the next-in-sequence course.

A student admitted to the College of Arts and Sciences from another college of Cornell University, or from any other institution of collegiate rank, will receive credit toward the degree of Bachelor of Arts for the number of hours to which his record may, in the judgment of the faculty, entitle him. Ordinarily the total may not exceed sixty hours, and no more than fifteen hours may be in courses not commonly given by the College of Arts and Sciences. In order, however, to obtain the degree of Bachelor of Arts, a student must, as a candidate for that degree, have been in residence at least two years in the College of Arts and Sciences, and in that College only.

ADVISING

The counseling staff of the Dean's Office and certain designated faculty members act as advisers to freshmen and sophomores. Their role is to assist the student in his choice of studies, to advise him during the term regarding his work, and to provide him help with personal problems and the choice of a career.

At the time of acceptance into a departmental major, the student will be assigned an adviser in the department administering his major study. The major adviser will guide the student in his selection of courses, counsel him on matters affecting his academic work, and supervise his progress toward the degree.

All students are expected to show initiative in planning their programs and to assume a large measure of responsibility for their progress in meeting requirements.

REGISTRATION IN COURSES

During a designated period each term, a student will, with the aid of an adviser or by himself, prepare a program of studies for the following term.

For the academic year 1969-70 registration periods will be:

For fall term coursesApril 7-18, 1969

For spring term coursesNovember 3-14, 1969

For late filing of a program of studies a fee of \$10.00 will be charged.

Failure to register during the announced period will be interpreted as intention to withdraw.

Every student must register in each term for at least twelve academic hours, exclusive of basic military training and physical education. The usual program for freshmen and sophomores will consist of five three-hour courses; juniors and seniors will usually carry a program of four four-hour courses. In order for a student to maintain satisfactory progress toward the degree, his program must average fifteen hours a term. No student may register for more than eighteen hours without special permission.

Program changes will be permitted, without petition or fee, upon recommendation of the adviser, prior to May 16 for the fall term and prior to December 13 for the spring term, and again during the first two weeks of instruction in each term. After the first two weeks of instruction any change will be subject to a \$10.00 fee and must have the approval of the Counseling Office. One week after the date for reporting midterm grades a course may be canceled for medical reasons only.

Freshmen will register by mail in the summer and may expect the necessary material by early July from the Counseling Office of the College of Arts and Sciences.

Course Levels

Undergraduate courses are offered at four levels numbered as follows:

100-199. Introductory courses, primarily for freshmen and sophomores.

200-299. Intermediate courses, primarily for freshmen and sophomores.

300-399. Advanced courses, primarily for juniors and seniors.

400-499. Courses on the senior and graduate-student level.

REQUIREMENTS FOR GRADUATION

Residence

The degree of Bachelor of Arts will not be conferred upon any student who has not been in residence in Cornell during the last two terms preceding graduation and registered in the College of Arts and Sciences, nor upon any student who has not been in residence for at least two years as a degree candidate in the College of Arts and Sciences and in that College only. Neither advanced standing credit, for the student who is accelerating, nor credit for work done *in absentia* is allowed toward meeting the residence requirement. Students normally spend eight terms in residence and may not exceed this length of time without the permission of the Committee on Academic Records. A student in good standing who leaves his degree in abeyance should not expect a request for reinstatement to be considered after five years.

Acceleration

Although students normally spend eight terms in residence before being awarded the Bachelor of Arts degree, early graduation is permitted under certain circumstances. A student who matriculates with fifteen hours or more of advanced placement credit will be called into the Counseling Office early in his freshman year and offered the option of accelerating. If he wishes to exercise this option, he may graduate in six or seven terms upon presentation of a satisfactory plan for early graduation.

An underclassman who does not have fifteen hours or more of advanced placement credit, but who wishes to graduate early and has a plan for acceleration that makes educational sense, should make an appointment with one of the Deans in the Counseling Office as early in his academic career as possible to discuss early graduation. Finally, he must submit a petition to the Dean's Office requesting permission to accelerate.

An upperclassman who has planned his courses so that he can finish the College requirements and his major requirements ahead of his scheduled graduation date, and who has the support of his adviser and the chairman of his major department, may also petition to graduate early. A petition to accelerate should be submitted to the Dean's Office clearly outlining the student's plans for early graduation. The deadline for submitting a request for acceleration is November 1 for the awarding of a January degree, and March 1 for the awarding of a June degree.

A student who changes his mind after a request for acceleration has been approved, and decides not to graduate early, must so inform the

Dean's Office in writing by the last day of the examination period before his accelerated graduation date.

Credit

For the degree of Bachelor of Arts, a candidate must have earned credit for 120 hours, of which 100 must be for courses in the College of Arts and Sciences. However, courses outside the College which are specified as meeting the requirements of his major program may be counted in the 100 hours. (There are some service courses, such as typing and remedial reading and writing, for which the College does not grant credit, and the student should confer with the Dean's Office before calculating them as part of his total number of hours.) Basic courses in military, naval, or air science or in physical education may not be counted in the 120 hours. Students who matriculated in the College in 1968 or earlier may earn as many as twelve hours of credit in advanced military courses. These hours will be counted as part of the twenty hours allowed outside the College. Students who enter in 1969 or after may not count any military science courses toward the 120 hours required for the Bachelor of Arts degree. However, military courses may be taken as electives, without credit, and used in satisfaction of requirements for Officer's candidacy and for the awarding of Army, Navy, Marine, or Air Force scholarships.

Other Requirements

A. FRESHMAN HUMANITIES. A student is required to complete in each term of his freshman year one of the courses specially designed to provide discussion in small classes and to emphasize written discourse. The two courses need not be in the same subject, but they must be designated as meeting this requirement.

(For details see Freshman Humanities Program, page 33.)

Note: This requirement is not the same as the humanities requirement in Distribution. A course used in satisfying the Freshman Humanities requirement may not be used in satisfying the Distribution or the language requirement.

B. FOREIGN LANGUAGE. This requirement must be fulfilled in a way that makes educational sense, which means that it must comprehend a language that has a substantial body of literature. Normally the student will complete part of the requirement, and may complete all of it, at Cornell. He may also complete part or all of it with a language that he has learned elsewhere. In either case it must be a language with a genuine literature.

There are basically four ways through which the language requirement may be met. First, the student may attain "Qualification" in two languages. Qualification is a level of competence indicated by performance in a College Board Achievement Test (where the required

score in a modern language or in Latin is 560), in a departmental placement examination, or in the final examination in the appropriate foreign language course. Qualification in a modern language demonstrates that the student is ready to proceed to a 200-level course. Second, he may meet the prescribed standards in a single language by completing a course in that language at the 200-level or above (a course for which Qualification is a prerequisite), or by earning an equivalent amount of advanced standing credit. Third, he may meet the requirement by attaining Qualification in one language if he has offered for admission three high school units of another language. And fourth, he may offer for completion of the language requirement or for Qualification a language not taught at Cornell; in this case, the student himself must arrange for a satisfactory test of his ability and see that the results become part of his record.

In the ancient languages satisfaction of the language requirement is achieved in Greek by completing Greek 203; in Hebrew by completing Hebrew 201 or 204; in Arabic by completing Arabic 208. In Latin, students who are placed in 107 complete the requirement by passing two three-hour courses beyond 107; those who are placed in 201 by passing 201; placement higher than 201 satisfies the requirement. Advanced placement credit in Greek and Latin is granted for evidence of achievement well beyond the level of Qualification. (For more information, see *Classical Languages*, p. 11.)

Qualification in Greek is attained by passing Greek 103. Qualification in Latin is attained on the basis of the College Board Achievement Test (where the required score is 560), by passing Latin 107, or by placement in a course higher than 107. (For placement in Latin see below, under *Classics, Latin*, in the *Courses of Instruction* section.) Qualification in Hebrew is attained by completing Hebrew 201 or by examination. Qualification in Arabic is attained by completing Arabic 207 or by examination.

There are two paths available to the student who is not qualified in a modern foreign language. He may take a sequence of two six-hour courses (numbered 101 and 102) which emphasize conversation and the structure of the language; or he may take a sequence of four three-hour courses (numbered 131-134) which emphasize reading comprehension. These are not fixed paths, and the student will be placed, by examination and by preference and probable major, in the course most likely to meet his needs. He may move from one of the six-hour courses into one of the three-hour courses. He may attain Qualification, and hence progress to a 200-level course and the completion of the requirement, at the end of any one of the courses, whenever he demonstrates sufficient competence in that language. He may attain Qualification in two languages, and thus meet the requirement, whenever his final examination scores indicate sufficient control of those languages.

A native speaker of a language other than English in which there is a substantial literature or any student who has learned such a language may take the placement examination and use that language to satisfy the requirement. All international students must fulfill the Freshman

Humanities requirement (first taking "English as a Second Language" if necessary) and the normal language requirement. If a student's native language does not have a substantial literature, the language requirement must be fulfilled by another foreign language which does have a substantial literature.

Although students may use appropriate languages studied or learned elsewhere to meet the language requirement, no formal course-hour credit will be given, except for students who are following an accepted plan of acceleration (or, in exceptional cases, are repairing deficiencies) and who have been granted advanced placement credit beyond the level of Qualification.

By the end of his fourth term a student is to meet at least the level of Qualification in one foreign language. When a student has attained Qualification in one language and it is in his academic interest to delay completion of the requirement until his junior year, his adviser may permit him to do so. However, since several departments demand completion of the requirement as one of the prerequisites for acceptance into the major, the student should plan his language courses carefully and consult with the Counseling Office or his adviser, the department of his prospective major, and the department of the appropriate language.

A student wishing to continue a modern foreign language in which he has not taken a College Board Achievement Test must first take a placement examination given by the University Testing and Service Bureau. He may take the examination if he feels that the College Board score is not an accurate indication of his ability. The examination will be given at the end of every semester and on October 8 and February 25 of the 1969-70 academic year. Ordinarily the examination is also given during Orientation Week in September.

C. DISTRIBUTION. Each student must complete six hours of related course work in four of the seven groups listed below, including one six-hour sequence in the physical or biological sciences, one in the social sciences or history, and one in the humanities or expressive arts. The fourth group may be six hours of related course work in mathematics or in a group not previously elected. Courses used to satisfy the Freshman Humanities or the language requirements may not be used to satisfy the Distribution requirement. The student should complete this requirement during his first two years.

For the *specific courses* which satisfy the requirement, one should consult the headings of the various departments in the *Courses of Instruction* section of this *Announcement*.

1. *Mathematics*
2. *Physical Sciences:* Astronomy, Chemistry, Geology, Physics
3. *Biological Sciences*
4. *Social Sciences:* Anthropology, Economics, Government, Linguistics, Psychology, Sociology
5. *History*
6. *Humanities:* Classics, Comparative Literature, English, Modern Foreign Literature, Philosophy, Semitic Literature

7. *Expressive Arts*: Advanced Composition (English 205-206), History of Art, Music, Special Forms of Writing (English 203-204), Theatre Arts

D. THE MAJOR. Each student must satisfy the specified requirements of the major as listed by his major department. The major in a subject is defined as including not only the courses in that department but also the courses in related subjects offered in satisfaction of the major requirements.

E. PHYSICAL EDUCATION. During the first four terms of residence each student must complete the University requirement of four terms of work in physical education. The courses in physical education are described in publications which the Department of Physical Education makes available to students at registration.

F. ELECTIVES. Of the 120 required hours, each student must complete fifteen hours in courses not offered in satisfaction of requirements (A) through (E) above, and not given by the department supervising his major.

PETITIONING. Students with unusual circumstances may petition for exceptions to most regulations.

Bachelor of Arts With Distinction

The degree of Bachelor of Arts With Distinction in all subjects will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Arts, (1) have received the grade of B— or better in at least ninety hours of courses taken while registered in the College of Arts and Sciences, and of A— or better in at least sixty of these; (2) have not received a grade below C— in more than one course; (3) have received no failing grade. To qualify for the degree of Bachelor of Arts With Distinction in all subjects, a candidate must have completed at least sixty hours at Cornell in courses taught in the College of Arts and Sciences; and if he has received credit toward his degree for work done in another institution, the requirement of grades shall be prorated for the residue of work which must be completed in Arts and Sciences at Cornell.

Bachelor of Arts With Honors

The degree of Bachelor of Arts With Honors will be conferred upon those students who, in addition to having completed the requirements for the degree of Bachelor of Arts, have satisfactorily completed the Honors program in their major subject and have been recommended for the degree by the department representing their major subject.

Honors programs are designed to free the exceptionally promising student for a substantial portion of his time from the ordinary requirements of academic courses in order that he may be able to broaden and

deepen his understanding of the field of his special interest, to explore branches of his subject not represented in the regular curriculum, and to gain experience in original investigation. A candidate for the degree of Bachelor of Arts With Honors is usually required to pass a comprehensive examination in his major subject or to submit a thesis or some other satisfactory evidence of capacity for independent work. He may receive the degree with honors at one of three levels: *cum laude*, *magna cum laude*, or *summa cum laude*. When performance does not justify a degree with Honors, the student may receive course credit toward the degree of Bachelor of Arts.

A student who, after admission to Honors, is found to be unsuited to Honors work, will revert to candidacy for the regular Bachelor of Arts degree.

GRADES AND ACADEMIC STANDING

Only freshmen will receive midterm grades. Final grades for courses range in descending order from A+ through D-, the lowest passing grade. F is a failing grade. No credit toward graduation will be given for a course in which a failing grade has been received, unless the course is repeated and a passing mark received.

Final grades of S or U may also be given in some courses. S means the student receives the credit specified for the course; U means no credit. In distinction from the grades A+ through F, the grades of S and U have no assigned numerical equivalents and will not enter into a student's grade average. Students should consult individual instructors for their definitions of S and U. An undergraduate registered in the College, after consultation with his adviser, may elect to receive a grade of S or U instead of one of the letter grades (A+ to F) in one academic course a term provided that the course is not offered in satisfaction of his major and provided that the instructor is willing to assign such grades. The student may register for the S or U option by filing a permission card with the Scheduling Office. Any changes in exercising the option will be governed by the regulations applying to changes of course.

In certain courses, deemed by the College to require no greater precision of grading, all final grades will be S or U. Such a course may be counted towards the student's major, with the permission of his adviser and of the chairman of the major department. Furthermore, a student may simultaneously take two of the College's S or U courses if both are offered exclusively on an S/U basis, or if one is offered exclusively on an S/U basis in the Arts College, and the other is an education course offered exclusively on an S/U basis, and is required for the completion of the student's education program.

An *incomplete* is not a satisfactory grade. It is used to indicate that a course has been left incomplete with respect to specific assignments which may include the final examination. The mark of *inc* will be assigned only in case of illness or prolonged absence beyond the control

of the student, and only when the student has a substantial equity in a course. A student will have a substantial equity in a course when the remaining work can be completed without further registration in the course and when he has a passing grade for the completed portion. When a grade of *inc* is reported, the instructor will also indicate the reasons for it and the conditions for removing it. A mark of *inc* may be removed, with the consent of the Dean and upon payment of the fee required by the University, by meeting those conditions, by examination, or by whatever alternative methods the concerned department may direct. Unless a make-up grade is received in the Dean's Office within one term (see p. 25 for specific date), an *inc* will revert to a grade of F.

A student will be considered in good academic standing for the term if, taking a normal course load of at least fifteen hours, he receives no grade of F or U and receives no more than one D. If his record falls below this level he may be warned, placed on "final warning," suspended for a specific period of time (at least one year), or not allowed to register again in the College. Moreover, a student failing to make satisfactory over-all progress in grades, or in hours (whether from failures or "incompletes"), or in the requirements of the major may at any time be warned, placed on "final warning," suspended for a specific period of time (at least one year), or not allowed to register again in the College.

A student will not be allowed to register for a fifth term in the College (or for the first term of his junior year) unless he has been accepted into a major program of a department.

LEAVES OF ABSENCE AND WITHDRAWALS

For reasons satisfactory to the Dean and the faculty, a student in good standing may be given a leave of absence for a definite or indefinite length of time. If, because of financial, family, or health reasons, a student is required to leave the College with the expectation of returning, he should apply for a leave of absence. However, leaves of absence for medical reasons are issued only upon the recommendation of the University Clinic. A leave of absence is not *in absentia* study, and no credit toward graduation may be earned while on leave, except in limited amounts by members of the armed services. Students on leaves of absence are normally expected and urged to leave Ithaca.

If a leave of absence is to take effect during the term in which the student is already registered, it must be requested within ten days after midterm grades have been reported. After those dates it will be granted only upon approval of the Committee on Academic Records. A student may not take two consecutive leaves of absence.

A withdrawal is a voluntary severance of a student's connection with the College. If it is to take effect during the term for which the student is already registered, it must be requested within twenty-five days after midterm grades have been reported. A withdrawal assumes that the student will not return to this College.

Requests for leaves of absences must be submitted through the Counseling Office.

IN ABSENTIA STUDY

Under special circumstances, or for compelling academic reasons, students are permitted by the Committee on Academic Records to gain credit toward graduation by study *in absentia* at another institution. Most of the petitions approved by the Academic Records Committee have been for study abroad during the junior year by students majoring in a foreign language or literature. The work done *in absentia* must be approved by the student's major department as well as the Committee on Academic Records, and programs for such work must be planned carefully in advance.

CREDIT FOR SUMMER SESSION

Summer session study serves various purposes: following a plan of acceleration; making up deficiencies; satisfying the prerequisite for a course given during the regular college year; gaining knowledge of some special subject matter; enlarging one's choice of electives and exploring new interests. While the College values and encourages all these efforts, it will grant summer session credit only to the student who is accelerating under an approved plan or to the student who has been given permission to repair deficiencies. The use of summer session credit to complete a September degree is permitted only to students who have received permission from the Committee on Academic Records. More detailed regulations are printed on the Petition for Summer Session Credit which a student must file before he enrolls for summer study. Further information is available from the Dean's Office.

Summer courses may be taken before matriculation, but these should be limited to the usual college introductory courses and will be subject to approval for advanced standing credit as part of a coherent plan of acceleration. Upon departmental approval, previous summer session work may enable a student to register in more advanced courses. Summer courses taken after a student matriculates must be approved in advance for the particular purpose in mind. The student should consult with his adviser, the department concerned, and the Counseling Office before he can be sure that academic credit will be granted for summer study.

No credit may be earned in a summer session of less than four weeks except by special permission; and no credit will be allowed for a course passed at less than a grade of C- or 70, or the equivalent.

IMPORTANT DATES, 1969-70 (Subject to change)

	<i>Fall term</i>	<i>Spring term</i>
Registration for new students	Th, Sept. 11, '69	Th, Jan. 29, '70
Registration, continuing students	F, Sept. 12	F, Jan. 30
Instruction begins, 7:30 a.m.	M, Sept. 15	M, Feb. 2
Last day for changing courses without fee	S, Sept. 27	S, Feb. 14
Last day for dropping courses	F, Oct. 31	F, Mar. 20
Preregistration for 1969-70	(See below*)	
Modern Language Placement examinations	W, Oct. 8	W, Feb. 25
Last day for requesting leave of absence for current term	W, Nov. 5	W, Apr. 8
Last day for requesting withdrawal for current term	W, Nov. 19	M, Apr. 20
Last day for changing preregistration	F, Dec. 12	F, May 15
Final examinations begin	M, Jan. 12, '70	M, May 25
Last day for submitting make-up grades for previous term incompletes	T, Jan. 20	T, June 2
Final examinations end	T, Jan. 20	T, June 2

* Preregistration for 1969-70:

For fall term courses, 1969: April 7-18, 1969.

For spring term courses, 1970: November 3-14, 1969.

SPECIAL PROGRAMS

THE SIX-YEAR Ph.D. PROGRAM. For the exceptionally able and committed student who intends to go on to doctoral study in the liberal arts or sciences, Cornell offers a program leading to the A.B. degree in three years, the M.A. in four, and the Ph.D. in six. For details see p. 287, at the end of the *Courses of Instruction* section.

Certain other programs of study are available which do not in themselves lead to a degree but consist of an arrangement of optional courses constituting a useful adjunct to the student's regular major.

THE COLLEGE SCHOLAR PROGRAM. This is primarily a College-wide Honors program designed to provide particularly able students with an educational experience that will most fully complement their interests and their talents. While it assumes no special categories and has no fixed prerequisites, the program will probably appeal most to the student who wishes to combine a traditional major with an entirely different interest (such as mathematics and one of the performing arts) and to the student who wishes to combine different disciplines into one coherent plan of study (such as International Relations or Comparative Literature).

There are about forty College Scholars in a class, and theirs is normally a four-year program, determined by the student and a board of faculty advisers, leading to a Bachelor of Arts degree. During their underclass years participants are relieved of all general College requirements, but they are expected and encouraged to broaden their experience and to explore interests and abilities not already manifest before their arrival at Cornell. The general requirements might also be replaced by the beginnings of a thorough training in one area (such as French literature, philosophy, and history) or in one period (such as the Enlightenment).

During their upperclass years some College Scholars will want to pursue a normal departmental major, which is already rich and diverse. Others will decide that their educational needs might best be served by departing from the traditional categories. Such students might well concentrate in one of the existing interdisciplinary programs such as American, Asian, or Latin American Studies, Greek Civilization, or Comparative Literature (these programs are described in detail in other sections of this *Announcement*). Still other students, in consultation with their advisers, will want to work out a plan which draws upon and unifies the resources of a number of departments. A major in Area Development would involve courses in economics, government, history, and social psychology; a major in History and Literature would join studies in language and philosophy as well as history and literature; studying the history of art and doing one or more of the fine arts is a possible and sensible combination. Such freedom presupposes both scholarship and maturity, and the College Scholar is expected to develop a thoughtful plan of study and to pursue his work with distinction.

Courses of independent study designed to complement or amplify a particular program may be arranged with or through the student's adviser. Independent study will be granted by the adviser, primarily to upperclassmen, when there is no regular course available and it meets a clear curricular need. For an account of the courses see page 294 at the end of the *Courses of Instruction* section.

Most students will be admitted into the program at the end of their first semester at Cornell, though it is possible, if places are available, to be accepted at any time during the first two years. The College Scholar will normally be granted sufficient financial aid to meet his needs. Prospective applicants should write to Mr. Robert Scott, Assistant Dean for Admissions, Goldwin Smith Hall, Cornell University, Ithaca, New York 14850.

THE PROGRAM IN GREEK CIVILIZATION. This is a program of studies in Greek civilization for a select group of freshmen and sophomores, whether they plan to concentrate in the sciences or in the humanities. Its purpose is to give unity to a student's introduction to the liberal arts as he gains some understanding of philosophy, history, government, science, literature, art, and philosophy. A considerable amount of substantive knowledge is unified by its common origin in Hellenic culture, and the student will be introduced to this world which forms the deepest foundations of Western civilization.

An integrated approach to a single culture through the various dis-

ciplines is an experiment in liberal education. It is an experiment of a sort that needs to be renewed again and again in the humanities, since its goals—precise knowledge and broad horizons—are too easily separated. Ancient Greece is an ideal focus for such an approach. Everything we mean by “civilized” exists there in the highest quality and in manageable quantity—great poetry, art, philosophy, history, rhetoric and science. A study of the important works can lead to an appreciation of each of these disciplines as it has been practiced at any time and in any place. For gaining perspective on our own society, remoteness in time is usually an advantage.

The program is also an alternative to a professionalism which leaves students no occasion to raise the great questions of life in any systematic or scholarly way, a purpose for which many of the best students come to college in the first place. Because the combination of familiar and foreign elements in Greek thought is complicated, much of the teaching and learning will be through discussion. For that reason the program is limited to ten students each year. Regular course meetings will be supplemented by colloquia involving the whole group, faculty and students, every two weeks. Participation in the program leaves the student free to take two other courses each semester and so to satisfy all underclass requirements and to prepare for his major. A typical schedule for the first two years follows. (For a detailed account of the courses see p. 285 at the end of the *Courses of Instruction* section.)

FRESHMAN YEAR

<i>Autumn</i>	<i>Spring</i>
Greek Language	Greek Language
Greek History	Greek History
Greek Literature in Translation	Greek Political Thought
Elective	Elective
Elective	Elective

SOPHOMORE YEAR

Greek Literature in translation	Greek Philosophy
Greek Archaeology	Greek Science
Greek Language	Greek Language
Elective	Elective
Elective	Elective

Faculty members in the program will serve as academic advisers for its students. All ten members of the program will receive scholarships based on need. For further information write to Professor Donald Kagan, 316 West Sibley Hall, Cornell University, Ithaca, N.Y. 14850.

INTERNATIONAL STUDIES. Students who wish to focus on some aspect of international studies should be able to organize a program of courses that will fit their needs well. For example, in the College of Arts and Sciences there are courses in comparative government, international relations, international law and organization, international economics, and the economics of development; they are listed under anthropology, Asian studies, economics, government, history, and sociology. There are

also courses in over twenty modern foreign languages. Cornell does not offer a degree in "international relations." The Department of Government does, however, offer a number of courses in international law and relations and it is possible at the graduate level to major in these subjects.

The College of Agriculture offers courses in the economics of agricultural development, international agriculture, and rural sociology. The School of Business and Public Administration offers courses in international development. The School of Industrial and Labor Relations offers courses in international and comparative labor relations.

The student seeking specialized foreign-area knowledge may focus on one of the following interdisciplinary area programs: Chinese Studies, Latin American Studies, and Southeast Asian Studies. In addition, it is possible for the student to pursue an area interest in African studies, European studies, South Asian studies, or Soviet studies.

Please note that the student must do his major work in one of the relevant discipline fields of the humanities, social sciences, or certain natural sciences—it is in that major discipline field that he will receive his degree. Although Cornell offers an undergraduate major in Asian Studies, it does not offer advanced degrees in area studies as such. Course work in area and functional programs is counted as one of the student's minor fields.

PREPARATION FOR TEACHING. Teacher education at Cornell is under the supervision of the University Committee on Teacher Preparation. It is possible to satisfy the New York State requirements for provisional certification to teach English, a foreign language, a science, or mathematics while completing the A.B. program of the College. A fifth year of study is necessary to become permanently certified to teach in this state. Prospective teachers of history or one of the social sciences may enroll in a five-year program leading to a permanent certificate. This is also true of the subjects in which provisional certification is possible. Students who wish to teach in elementary schools must apply for a fifth year which leads to a Master in Arts in Teaching and, normally, permanent certification.

All students interested in elementary or secondary school teaching will need to plan their programs very carefully and should inform their advisers of this interest as early as possible, but not later than the end of the sophomore year. Questions may be directed to the University Office of Teacher Preparation in 201 Rand Hall or to the faculty member in the student's department who is in charge of the teacher preparation program. Students desiring practice teaching experience must apply no later than the end of the first term of the junior year since the number of openings for student teaching is limited.

PREMEDICAL STUDENTS. Students who intend to prepare for the study of medicine or dentistry are urged to report once each semester to the office of the Premedical Advisory Committee, 121 Clark Hall. This Committee has established standard procedures to facilitate the

eventual preparation of letters of evaluation for applicants to medical and dental schools.

Medical educators generally agree that in planning his college course a premedical student should not allow his interest in science to exclude studies in the humanities. They also agree that it would be unfortunate for the future of medicine if all premedical students followed the same course of studies or majored in the same subject. For these and other reasons there is no fixed premedical curriculum at Cornell. Certain minimum requirements for admission are, however, prescribed by all medical schools. The most substantial of these requirements is in chemistry, and it is therefore recommended that the premedical student include chemistry in his freshman course of study. Some premedical students choose to take two sciences in the freshman year, either chemistry and physics or chemistry and biology. Students who plan to pursue major studies in biological sciences will find it advantageous to include biology in their freshman programs.

The Premedical Advisory Committee suggests that since almost all medical schools require English Composition for admission, prospective medical school applicants should elect to satisfy the Freshman Humanities requirement with six hours of English.

MILITARY TRAINING. Programs leading to a commission are offered in military science, naval science, and aerospace studies (AFROTC). For information on credit granted toward the Bachelor of Arts degree for military science courses see page 18, *Credit*. Full descriptions of the programs may be found in the *Announcement of Officer Education*.

THE LIBRARIES

Cornell has eighteen separate libraries—two of them central and sixteen of them special and departmental. The central library's total holdings of more than three million volumes make it the seventh largest university library in the country; about a hundred and seventy thousand volumes are added each year. The College is the principal beneficiary of the two main libraries, the Uris Undergraduate Library and the Olin Research Library, which face each other on the south side of the Arts Quadrangle.

The prime aim of the Uris Library is to bring students and books as closely together as possible. Accordingly, the bookstacks, save for essential reserve books in heavy demand, are open to all readers. The holdings are selective rather than comprehensive. In addition to a reference collection of three thousand bibliographies, encyclopedias, handbooks, and dictionaries, and about two hundred and seventy periodicals, Uris contains about sixty-five thousand volumes for course reading or for general exploration and recreation. A suite of three listening rooms houses a large collection of records and tapes of poetry, drama, fiction, and other material in the spoken arts.

The John M. Olin Library is one of the country's major research libraries. The first floor and lower level contain the Reference and

Circulation Departments, the Wason Collection (the most complete holdings of Asian material in the country), the Rare Book Department, the Collection of Regional History and University Archives, and the Department of Maps, Microtexts, and Newspapers. The union catalog of all libraries on the Ithaca campus and the bibliography collection are on the first floor, near the center of the building.

The second through the seventh floors contain bookstacks and offices. They are reserved primarily for faculty, staff, graduate, and honors students, but undergraduates can easily and quickly obtain or discharge books at the circulation desk.

As a means of acquainting new students with its facilities and services, the library arranges for all freshmen to have a lecture-tour early in the fall term.

SCHOLARSHIPS AND PRIZES

Open to All Students

New York State offers various types of financial assistance to qualified college students who are state residents. It is very important that students seeking such aid obtain full information and meet promptly each application deadline.

SCHOLAR INCENTIVE PROGRAM. Applications should be filed before July 1 for each academic year but will be accepted up to December 1. Applications for the spring semester only have an April deadline. Annual application is required.

REGENTS COLLEGE SCHOLARSHIPS FOR UNDERGRADUATES. Candidates should seek directions from their high school principal and/or guidance counselor.

Information on all of the above may be obtained by writing to the Regents Examination and Scholarship Center, New York State Education Department, Albany, N.Y. 12224. Students seeking New York State guaranteed loans should apply to the New York State Higher Education Assistance Corporation, 159 Delaware Ave., Delmar, N.Y. 12054.

Open Only to Arts and Sciences Students

The scholarships listed *below* are open only to students of the College of Arts and Sciences. For these and others open to all students at entrance, a single application form accompanies the application for admission. Enrolled students may compete for prizes, which are described in a publication obtainable in the Scheduling Office of the College, Goldwin Smith Hall.

THE DEAN'S SCHOLARSHIPS are open to men and women entering the College of Arts and Sciences. The annual awards vary from \$100 to \$2,200, depending upon financial need. The tenure is four years if the scholastic record of the recipient is creditable. At least twenty scholarships are awarded annually. Final selection and award are based upon academic promise, general character, and financial need. Preference will be given to candidates from areas not well represented in the present student body of the College of Arts and Sciences.

THE SPENCER L. ADAMS SCHOLARSHIPS (two scholarships) are open to freshman men. Annual award, \$800. Tenure is four years, providing academic standing in the upper fifth of the class is maintained. Preference will be shown to students majoring in the humanities, foreign language or economics.

THE ELISABETH REAMER CARSON SCHOLARSHIP ENDOWMENT was established by James H. Carson and Elisabeth Reamer Carson in 1958. Elisabeth Reamer Carson graduated in 1927. The scholarship is open to any student in the College. Annual award may vary from \$400 to \$1,250. The scholarship may be held for four years. Financial need, academic promise, and general character will be considered in making the award.

THE GEORGE C. BOLDT MEMORIAL SCHOLARSHIPS (three scholarships) were created by George C. Boldt, Jr., as a memorial to his father. Each is worth \$500. They will be awarded at the close of the junior year to the three men students in the College who are considered most deserving of this aid. Applications for these scholarships must be filed in the Office of the Dean before March 15 of the academic year preceding the year for which they are awarded.

THE CHESTER BUCHANAN MEMORIAL SCHOLARSHIP is a gift of Mrs. Claire F. Buchanan, in memory of her son, Chester Buchanan. It carries an annual stipend of \$300. It is awarded each year on the recommendation of the Department of Geology to the outstanding male senior who is majoring in this subject.

THE CORNELIS W. de KIEWIET SCHOLARSHIP, established by members of the Board of Trustees in honor of the former Acting President of Cornell University, carries an annual award of \$500. It will be awarded to a student majoring in history who, at the end of his junior year, shows the greatest promise of creative work in history.

THE CORNELIA L. HALL SCHOLARSHIP, established by a gift of the late Mary F. Hall, is worth \$120. It is "open to any meritorious young woman of this State, who is pursuing the studies of the A.B. course and who is in need of financial assistance." Under the terms of the bequest, preference must be given to a suitable candidate from Tioga, Tompkins, or Chemung County; within this preferred class, women of senior or junior standing will be regarded as entitled to first consideration. Applications must be filed in the Office of the Dean before March 15 of the academic year preceding the year for which the scholarship is awarded.

THE GERTRUDE C. HEMINGWAY SCHOLARSHIP, amounting approximately to \$500, is awarded annually to "some deserving young woman student majoring in French, Spanish, or Greek language." Quality of work and financial need will be considered in making the award.

THE MYRTLE H. MILLER SCHOLARSHIP is open to men and women entering the College of Arts and Sciences. Annual award varies but may be as high as \$1,200. Tenure is four years. One or more scholarships are available each year. Final selection and award are based upon academic promise, proficiency in mathematics, general character, and financial need.

THE MICHAEL W. MITCHELL MEMORIAL SCHOLARSHIP, initiated by Justice William O. Douglas and a group of his associates, carries a stipend of \$350. Under the terms of this bequest, the award is made upon the recommendation of the Chairman of the Department of Geology to a "student

majoring in geology who proves himself adept in other liberal arts fields as well as geology—a student of the world.”

THE HENRY L. O'BRIEN, JR. SCHOLARSHIP, established by the W. Alton Jones Foundation, Inc., in 1953, as a memorial to Henry L. O'Brien, Jr., is worth \$885 a year. It is awarded to a male citizen of the United States entering the College of Arts and Sciences as a freshman. It may be retained for four years if his scholarship record is satisfactory. Character, scholastic ability, need, and participation in extracurricular activities will be considered in awarding the scholarship.

THE FREDERICK A. PEEK SCHOLARSHIP FUND is open to men and women entering this College. The annual award varies from \$100 to \$1,500 according to financial need. The scholarship may be held for four years, provided the recipient maintains an average in the top half of the class. Financial need, academic promise, and general character will be considered in making the award.

THE FREDERICK A. RICE SCHOLARSHIP ENDOWMENT scholarship is gift of Frederick A. Rice, '09, and Mrs. Rice, and is open to men students in this College. The annual award is \$140, and the scholarship may be held for four years. Preference is given to candidates from California. Financial need, academic promise, and general character will be considered in making the award.

THE WINTON G. ROSSITER SCHOLARSHIP, worth \$250 is awarded annually to an outstanding senior in this College, who while earning a good part of his expenses through his own efforts, has nevertheless maintained a distinguished academic record and contributed substantially to the life of the University.

THE IDA AND WILLIAM KERR MEMORIAL PRIZE was created by Mrs. Jane M. G. Foster '18 in memory of Ida Cornell Kerr '84 and William Ogden Kerr '77 and in appreciation of their many kindnesses to Cornell students. The prize, in the form of books worth \$100, is awarded for an essay written by a graduating senior. Each spring seniors with excellent records are invited to submit essays.

COURSES OF INSTRUCTION

THE FRESHMAN HUMANITIES PROGRAM

To replace its traditional freshman composition program, the University has recently inaugurated a series of small discussion and writing courses in the humanities which are jointly conducted by ten departments in the College of Arts and Sciences. The aim of the new program is two-fold: to offer the incoming student a wide variety of subjects from which to choose, and to provide him with the opportunity of relating his written assignments directly to the subject-areas which primarily interest him. The courses are uniform only in the sense that all of them require intensive practice in composition and that the enrollment in each section is limited to twenty students.

To satisfy the Freshman Humanities requirement, each student must elect any two (but no more than two) of the courses which are described below. Students are expected to enroll in one of these courses during the fall semester and in another during the spring semester of their first year of residence. Unless otherwise noted, each course will be offered both in the fall and the spring. Each course carries three hours of credit. A course used in satisfying the Freshman Humanities requirement may not be used in satisfying the Distribution or language requirement. Supplementary information about the program and specific instructions about registration procedures will be mailed separately to all incoming freshmen in July.

The Classics

Classical civilization Courses 119 and 120, though either may be taken separately, are designed to constitute a broad but carefully integrated introduction to the literature and thought of Greco-Roman civilization.

CLASSICS 119. FRESHMAN SEMINAR IN GREEK LITERATURE

Fall term.

Readings, in translation, of Homer's *Iliad* and *Odyssey*, Hesiod's *Theogony* and *Works and Days*, several plays including Aeschylus' *Oresteia* and Sophocles' *Oedipus Tyrannus*, and selections from the lyric poets.

CLASSICS 120. FRESHMAN SEMINAR IN LATIN LITERATURE

Spring term.

Readings, in translation, of selected major works of Latin prose and poetry including Lucretius' *On the Nature of Things*; Virgil's *Eclogues*, *Georgics* and *Aeneid*; excerpts from the histories of Tacitus; Petronius' *Satiricon*. Discussion and frequent essays.

Comparative Literature

COMPARATIVE LITERATURE 101. VARIETIES OF WESTERN LITERATURE

Fall term.

Informal discussion of at least four works chosen for their historical diversity and various ways of appealing to the reader. A typical list might include a dialogue of Plato, a classical tragedy, a modern comedy and a novel. Additional reading will be assigned at the discretion of the individual instructor and on the basis of class need and response.

COMPARATIVE LITERATURE 102. THE MODERN CONSCIOUSNESS IN LITERATURE

Spring term.

Informal discussion of works by at least four major modern writers, European or American, which illustrate significant changes in literary sensibility in this century. Additional readings will be introduced by the individual instructor on the basis of class need and responsiveness.

English

ENGLISH 131. EXPERIENCE AND EXPRESSION

Practice in the art of imaginative expression and attempts to explore the nature of that art. Students will write original works of poetry, fiction, and the more personal kinds of exposition, and examine the language, rhetoric, and style of their own work as well as the work of established writers.

ENGLISH 135. WRITING ABOUT EXPERIENCE

Designed primarily to give the student practice in writing about his own experience, either in the present, here at Cornell, or in the past. Most of the class time will be given to the students' own work.

ENGLISH 139. COMEDY AND TRAGEDY

Relations of comedy to tragedy and a survey of these forms from Sophocles to Samuel Beckett. Readings from such writers as Shakespeare, Molière, and Bertolt Brecht. Student writing will deal with analysis of specific texts as well as with individual responses to comic and tragic forms.

ENGLISH 141. BIBLE AND ANCIENT AUTHORS

Informal discussion of selected books from the Old and New Testaments, considered both as literature and moral teaching. Some of the major cycles of classical and Norse mythology will also be studied.

ENGLISH 145. AMERICAN LITERATURE AND VALUES

A study of the ideals of self-reliance and success as embodied in fiction, essays, and drama by representative writers from Benjamin Franklin to Malcolm X. Analysis of individual works will include consideration of how conformity, alienation, and rebellion have constituted responses to each writer's environment—social, economic, and racial.

ENGLISH 147. HUMANISM

Informal discussion of major works illustrative of the flowering of Renaissance Humanism. Selected classical and modern works will be read as well, as a means of assessing the general value of the Humanist conception of man's nature and potentiality and the Humanist educational ideals.

ENGLISH 149. THE SEARCH FOR ORDER

Literature and man's search for meaning in the Renaissance and twentieth century: social, moral, and scientific perspectives in major literary forms. Readings will include poems by Yeats, Frost, Eliot; Swift's *Tale of a Tub*, *Waiting for Godot*, *Hamlet*, and *Rosencrantz and Guildenstern Are Dead*.

ENGLISH 151. SHAKESPEARE AND MODERN

Intensive study of some four plays by Shakespeare and three works drawn from the drama and fiction of the nineteenth and twentieth centuries. The course seeks not merely to encourage familiarity with major works of Shakespeare and of recent authors but also to study the drama and novel as literary forms and to examine and compare the different attitudes and world-views implicit in these works. Texts include such plays of Shakespeare as *Richard III*, and *Henry IV*, *Hamlet*, and *Antony and Cleopatra*; and modern works by such writers as Dickens, Conrad, Hardy, Joyce, Shaw, and Bellows.

ENGLISH 153. THE LITERATURE OF REASON AND UNREASON

Intended as a study of prose forms dominant in the eighteenth century (satire, imaginary voyage, autobiography, realistic fiction), the course will consider a few major texts of the period and seek out comparable forms in modern literature: *Robinson Crusoe*, *Castaway*, and *Lord of the Flies*; *Gulliver's Travels* and *Animal Farm*; *Tom Jones* and *Augie March*; autobiographical writings of Bunyan and Baldwin.

ENGLISH 157. AMERICAN FICTION AND CULTURE

Study and informal discussion of nineteenth-century American novels which comment significantly on emerging patterns of American manners and morals. The novelists to be studied include Cooper, Hawthorne, Melville, Howells, and James.

ENGLISH 159. POLITICS, LANGUAGE, AND LITERATURE

A study of the language and rhetoric occasioned by political events, past and present. Writings of different kinds and intentions (from the *New York Times* to the works of Whitman, Yeats, Orwell, and Hemingway) will be read in an effort to discover what prose style can tell us about the author's motives and character. Written exercises in analysis, argument, autobiography.

ENGLISH 163. RELATIONSHIPS AND THE CREATIVE PROCESS

A study of writing, emphasizing the writer's need to find analogies and other relationships in the seemingly disparate materials he works with. Readings will include stories (Chekhov), poems (Lowell and Yeats), essays (Agee and Camus). Views on imagination and the creative process by Henri Poincaré, William James, and Frost will be discussed.

ENGLISH 237. THE READING OF FICTION

(See p. 124).

ENGLISH 239. THE READING OF POETRY

(See p. 124).

French**FRENCH 205. FRESHMAN SEMINAR: MODERN FRENCH DRAMA**

Throughout the year. Credit three hours. Qualification in French required. (For definition of Qualification, see p. 18.) M W F 1:25. Mrs. McCall.

Studies of Apollinaire, Cocteau, Claudel, Giraudoux, Montherlant, Anouilh, Sartre, Camus, Beckett, Ionesco and Genet. Readings in French, discussion and papers in English.

FRENCH 207. PHILOSOPHY IN LITERATURE

Fall term. Credit three hours. Qualification in French required. (For definition of Qualification see p. 18). T Th S 10:10. Mr. Lewis.

An attempt to appreciate the role of literary language in the articulation of a philosophical position. Texts: Descartes, *Discours de la méthode*. Pascal, *Pensées*. Voltaire, *Zadig* and *Micromégas*. Diderot, *Supplément au voyage de Bougainville*. Camus, *Le mythe de Sisyphe*. Sartre, *Les Mouches*.

FRENCH 208. LITERATURE AND MARXISM IN TWENTIETH-CENTURY FRANCE

Spring term. Credit three hours. Qualification in French required. (For definition of Qualification see p. 18). T Th S 10:10. Mr. Lewis.

A study of Marxist conceptions of and influences upon the creation and interpretation of literature, with particular attention to the interaction of Marxism with surrealism and existentialism and to the doctrine of socialist realism. Critical analysis of texts by Aragon, Eluard, Nizan, Malraux, Sartre, Lefebvre, Althusser.

German

GERMAN 103. MODERN GERMAN DRAMA (IN TRANSLATION)

Fall term. Mr. Connor and staff.

The texts studied will include works by George Büchner, the Expressionists, Bertolt Brecht, Max Frisch, and others.

GERMAN 104. THE MODERN GERMAN NOVEL (IN TRANSLATION)

Spring term. Mr. Connor and staff.

Informal discussion of texts by Hermann Hesse, Franz Kafka, Günter Grass and others.

Government

GOVERNMENT 101S. AMERICAN GOVERNMENT

Spring term. Mr. Lewis.

A general introduction to American national government and politics.

GOVERNMENT 104S. COMPARATIVE GOVERNMENT

Fall term. Mr. Mazingo.

A comparative study of major contemporary political movements and governmental institutions and processes. Great Britain, France, Germany, Russia, as well as some of the newly emerging countries will provide the materials for the discussion of key issues.

History

HISTORY 105-106. INTRODUCTION TO WESTERN CIVILIZATION

Throughout the year. Credit three hours a term. First term prerequisite to second except by permission. Mr. Williams and staff.

A survey of European history since antiquity. Attention is given equally to the major political and social developments and to the intellectual heritage of the West. A considerable portion of the reading is in contemporary sources.

HISTORY 215-216. AMERICAN HISTORY

Throughout the year but either term may be taken separately. Messrs. Polenber, Silbey, and staff.

Several major topics are considered each term and use will be made of different modes of historical inquiry: political, constitutional, diplomatic, economic, social, and intellectual. A primary purpose will be to give the student opportunities to make his own historical judgments and analyze those made by others. These aims will be pursued largely through weekly seminar work and frequent short essays.

History of Art

HISTORY OF ART 103. ANALYSIS OF WORKS OF ART

Either term. Credit three hours. Various members of the department.

An introduction to the problem of articulating the visual experience. Students will meet in small classes of approximately twenty for discussion and examination of works of art, largely through reproductions but with occasional museum study, in order to provide training in the techniques of visual analysis. Readings and a number of short papers will be assigned throughout the term, but emphasis will be placed on classroom participation.

Conceived as a supplement to the study of art history, the course will not, however, approach the works of art in the usual historical or chronological fashion. The course may be also regarded as of general interest with application outside the field of art history.

Philosophy

PHILOSOPHY 100. FRESHMAN SEMINAR IN PHILOSOPHY

Either term. Fall term: Messrs. Malcolm, Chastain, Sorabji, and Lyons. Spring term: Messrs. Kim, Wood, and Lyons.

Romance Studies

(See French, p. 35, and Spanish below)

Semitic Languages and Literatures

SEMITICS 107. CLASSICS OF JEWISH AND ISLAMIC THOUGHT

Fall term. Mr. Ivry.

Readings, in translation, of selections from the several most important literary creations of Judaism and Islam.

SEMITICS 110. THE LITERATURE OF THE NEW TESTAMENT

Spring term. Mr. Carmichael.

An introduction to modern critical study of the New Testament.

Spanish

SPANISH 205. THE MODERN SPANISH NOVEL.

Fall term. Credit three hours. T Th S 11:15. Mr. Bernstein. Qualification in Spanish required. (For definition of Qualification, see p. 18.)

Reading and informal discussion of Spanish fiction from the early twentieth century to the present. Classroom discussion and written work to deal with problems of style, structure, characterization, etc. Readings in Spanish and English; discussion and papers in English.

SPANISH 206. THE MODERN SPANISH AMERICAN NOVEL

Spring term. Credit three hours. T Th S 11:15. Mr. Bernstein. Qualification in Spanish required. (For definition of Qualification, see p. 18.)

Reading and discussion of significant Latin American fiction of the twentieth century. Discussion and written work will center on problems of novelistic technique and interpretation. Readings in Spanish, discussion and papers in English.

AMERICAN STUDIES

Mr. S. C. Strout, Jr., Chairman.

The American Studies Committee seeks to encourage interdisciplinary work in the history and culture of America. At present it offers the choice of a major subject in American Studies only to graduate students in English and history.

ANTHROPOLOGY

Mr. R. J. Smith, Chairman; Messrs. R. Ascher, F. Cancian, T. Gregor, L. W. Hazlehurst, C. F. Hockett, K. A. R. Kennedy, B. Lambert, W. W. Lambert, T. F. Lynch, J. V. Murra, M. E. Opler, J. M. Roberts, L. Sharp, J. T. Siegel, W. A. Stini, Miss Judith M. Treistman, Mr. F. W. Young.

Two majors are offered by the Department: (1) a major in anthropology, and (2) a major in social relations.

ANTHROPOLOGY. For fulfillment of the major students are required to have taken Anthropology 101 and 102 and an additional thirty-two hours chosen from courses given at the 300 level or above. Eight of these hours may be taken at comparable level in related fields outside the department and with the approval of the adviser. A minimum of eight hours in anthropology must be at the 400 level or above.

The student's developing interests may lead him to concentrate in the humanistic, social, or natural science aspects of anthropology, which as a broad field, includes the subdivisions of archaeology, social anthropology, linguistics, psychological anthropology, and physical anthropology. The specific program of courses in the major and related subjects is designed by the student in consultation with his major adviser.

Attention of students is directed to the course offerings in archaeology, biological sciences, and linguistics, where subjects closely related to anthropology are treated.

SOCIAL RELATIONS. The major in social relations is offered jointly by the Department of Anthropology and the Department of Sociology. The major provides the student with basic competence in cultural anthropology, social psychology, and sociology, while giving particular emphasis to the common methods of research in these disciplines. The student electing this major is expected to obtain a grasp of the common interests and evidence of these disciplines as well as knowledge of their unique insights in attempting to develop generalizations regarding man in society. The student's work is integrated in his senior year when he takes the Social Relations Seminar in which he is expected to interrelate aspects of the theory and data of the three disciplines.

1. Prerequisites to the major: The candidate must apply to the Committee on Admission to the Social Relations Major, offering the following:

- a. Either Anthropology 101 or Sociology 101.
- b. Either Psychology 101 or Child Development 115 or Sociology 281.
- c. Industrial and Labor Relations 210 or the equivalent.

2. The major. The major calls for a minimum of thirty-six hours of course work as follows:

a. Three pairs or other combinations of related courses at the 300 level or above, to be selected in consultation with the major adviser. These six courses must include two from each of the following disciplines: anthropology, social psychology, sociology.

b. At least one course in methods, to be selected from the following: anthropological methods, techniques of experimentation (psychology), methods in sociology, advanced psychological statistics, the philosophy of science or of social science, advanced statistics (such as Industrial and Labor Relations 311).

c. At least one course in theory which is related to social relations.

d. The senior seminar in social relations (Sociology 497 or Anthropology 495).

A list of courses that may be used to satisfy the requirements for the major in social relations is available from any major adviser.

Students seeking admission to the program in social relations should apply to the chairman of the Social Relations Committee, Mr. Robin M. Williams, Jr., Sociology.

SPECIAL PROGRAMS. Specialized individual study programs are offered in Anthropology 497-498 (Topics in Anthropology), open to a limited number of juniors and seniors. Consent of the instructor is required.

The Department of Anthropology holds colloquia throughout the academic year. Faculty from Cornell and other universities participate in discussion of current research and problems in anthropology; students are encouraged to attend.

THE HONORS PROGRAM. Students seeking admission to the Department's Honors program should file application on a form obtainable in the departmental office not later than February 15 of their junior year.

Final selection will be made by the Anthropology faculty. Honors students may fulfill part or all of their 400-level requirements by taking Anthropology 491 and 492.

DISTRIBUTION REQUIREMENT. The Distribution requirement in Social Sciences is met in anthropology by Anthropology 101 and 102; or 101 or 102 and either 201 or 202.

101. INTRODUCTION TO CULTURAL ANTHROPOLOGY

Either term. Credit three hours. Fall term: M W F 9:05, discussion sections to be arranged. Mr. Gregor. Spring term: T Th 11:15, discussion sections to be arranged. Mr. Murra.

A comparative study of the organization of cultural behavior in systems of communications, technology, social relations, ritual, ideas, and sentiments; the relation of such systems to personal behavior and to continuity, change, and cultural transfer in history. Illustrative materials drawn largely from non-Western societies.

102. THE EVOLUTION OF MAN

Spring term. Credit three hours. Anthropology 101 is not a prerequisite to Anthropology 102. T Th 11:15, discussion sections to be arranged. Mr. Lynch.

An exploration of the archaeological and fossil record of human evolution; emphasis is on the varied ways of uncovering, interpreting, and understanding man's biological and cultural development from the origin of man to the rise of civilization.

INTRODUCTION TO ARCHAEOLOGY

(Archaeology 200)

Fall term. Credit three hours. T Th 1:25. Mr. Ascher, Miss Milburn.

201-202. SEMINAR: PROBLEMS IN ANTHROPOLOGY

Throughout the year or either term. Credit three hours a term. Open to freshmen and sophomores who have had Anthropology 101 or 102 or both. Hours to be arranged. Mr. Smith, Miss Treisman.

A seminar designed to permit intensive development of selected topics and problems raised in Anthropology 101-102. Students will be expected to prepare research papers and lead discussions.

301. SOCIAL ANTHROPOLOGY

Fall term. Credit four hours. Open to juniors and seniors who have not had Anthropology 101. M W F 11:15. Mr. Sharp.

A study and comparison of the types of learned, shared, and transmitted behavior patterns and ideas by means of which men of various periods and places have dealt with their environment, worked out their social relations with their fellow men, and defined their place in the cosmos. An inquiry into human nature and its expression in man's institutional and intellectual creations.

[302. LANGUAGE AND CULTURE]

Spring term. Credit four hours. Mr. Hockett. Not offered in 1969-70.

303. PREHISTORIC ARCHAEOLOGY

Spring term. Credit four hours. M W F 11:15. Mr. Lynch.

A study of Old World prehistory from the origins of culture in the Palaeo-

lithic through the beginnings of civilization. Stress will be given to the interrelations between culture and environment in the Pleistocene; the origins and diffusion of agriculture, sedentism, and civilization; and the prehistoric background of European culture and society.

304. PHYSICAL ANTHROPOLOGY

Spring term. Credit four hours. M W F 9:05. Mr. Kennedy.

A survey of modern theories of man's biological history. The evidence for primate evolution in the data of the fossil record, comparative anatomy, biochemical anthropology, and animal behavior studies. Particular attention is given to taxonomy, phylogeny, protocultural development, and on-going human evolution.

305. PSYCHOLOGICAL ANTHROPOLOGY

Fall term. Credit four hours. T Th S 9:05. Mr. W. Lambert.

A detailed consideration of problems selected to illustrate the mutual relevance of psychology and social anthropology.

[312. CONTEMPORARY ANTHROPOLOGICAL THEORY]

Spring term. Credit four hours. Mr. B. Lambert. Not offered in 1969-70.

[313. CULTURAL CHANGE]

Fall term. Credit four hours. Not offered in 1969-70.

314. APPLIED ANTHROPOLOGY

Spring term. Credit four hours. T Th 2:30. Mr. Sharp.

What anthropology knows or suspects about some general processes of cultural change; and the application of these insights to practical problems confronting planned programs of change, and particularly projects involving the intervention in a foreign society of persons unused to working in exotic cultural idioms. Case studies are selected relevant to the interests not only of students in the humanities and social sciences but also of natural scientists concerned with modernization in various times and places and with the cultural transfer of techniques, conduct, ideologies and sentiment systems.

321. COMPARATIVE SOCIAL SYSTEMS

Fall term. Credit four hours. M W F 2:30. Mr. Hazlehurst.

Topics will include the comparative study of systems of kinship, politics, religion, and magic in preliterate societies and the relationship between these types of systems in particular societies. Also age and sex differentiation; age-sets and age-grades; division of labor, types of specialization, occupational associations; rank and occupation; social classes, caste, slavery, pawnship, and serfdom; secret associations; social networks and social mobility. References will also be made to theories concerning these phenomena.

322. COMPARATIVE RELIGIOUS SYSTEMS: SOUTH ASIA

Spring term. Credit four hours. M W F 10:10. Mr. Opler.

The histories, doctrines, rituals, symbolisms, contemporary movements, and interrelations of Hinduism, Jainism, Zoroastrianism, Islam, Sikhism, and selected tribal religious systems in South Asia.

324. MYTH, RITUAL AND SYMBOL

Fall term. Credit four hours. M W F 3:35. Mr. Siegel.

A survey of various approaches to the understanding of myth, cosmology,

ritual, and esthetic symbolism, drawing upon anthropological, psychological, and philosophical sources. The ideas of certain literary critics and historians of religion will also be considered. An attempt will be made to isolate the basic formal principles of symbolic structures, to analyze the nature and sources of the affective and cognitive aspects of symbolic meaning and to define the social and cultural functions of the major categories of symbolism.

326. ECONOMIC ANTHROPOLOGY

Spring term. Credit four hours. M W F 1:25. Mr. Cancian.

Data on economic systems of primitive and peasant societies and problems in the conceptualization of these data will be reviewed in terms of the "substantive," "formal," and "adaptive" approaches to economic anthropology. Attention will be given to economic change.

329. COMPARATIVE POLITICAL AND LEGAL ORGANIZATION

Fall term. Credit four hours. M W F 1:25. Mr. Murra.

A survey of the fields of primitive government and law. Selected governmental and legal systems will be compared in terms of relevant anthropological theories and problems.

363. ARCHAEOLOGY OF ASIA

Fall term. Credit four hours. M W F 9:05. Miss Treistman.

A survey of the archaeology of Asia with emphasis on the origins of civilization in India, Southeast Asia, China, and Japan.

[364. ARCHAEOLOGY OF THE AMERICAS]

Spring term. Credit four hours. Mr. Lynch. Not offered in 1969-70.

372. LIVING RACES OF MAN

Spring term. Credit four hours. M W F 10:10. Mr. Stini.

A survey of the major features of phenotypic variation in human populations today. Attention is directed to the evolutionary factors of race formation operating through time and across geographical lines, to the racial histories of particular human groups, and to the development of concepts about race in Western thought.

[416. THE CONTENT OF CULTURE]

Spring term. Credit four hours. Mr. Roberts. Not offered in 1969-70.

418. ETHNOHISTORY

Spring term. Credit four hours. M W F 11:15. Mr. Murra.

The utilization in historical research of concepts derived from field anthropology such as status, lineages, rights-in-land, or ethnogenesis. Problems in evaluating native oral traditions and early European eyewitness reports, with emphasis on African, Middle American and Andean regions.

COMPARATIVE RURAL SOCIETIES

(Rural Sociology 420, College of Agriculture)

Fall term. Credit four hours. Prerequisite, one general course in anthropology or sociology. M W F 11:15. Mr. Young.

[423. KINSHIP AND SOCIAL ORGANIZATION]

Fall term. Credit four hours. Not offered in 1969-70.

[430. ETHNOLOGY OF NORTH AMERICA]

Spring term. Credit four hours. Mr. Roberts. Not offered in 1969-70.

432. ETHNOLOGY OF SOUTH AMERICA

Spring term. Credit four hours. M W F 10:10. Mr. Gregor.

A descriptive survey and analysis of native cultures in terms of social, political, economic, and religious organization. Representative groups from all cultural areas are considered, ranging from such marginal cultures as those of Tierra del Fuego to such complex civilizations as the Inca.

433. ETHNOLOGY OF THE ANDEAN REGION

Fall term. Credit four hours. M W F 9:05. Mr. Murra.

The ecological, archaeological, ethnohistoric, and contemporary ethnological record of the region. Cultural communities in Andean development and the Andean heritage as a resource for modernization.

434. ETHNOLOGY OF ISLAND SOUTHEAST ASIA

Spring term. Credit four hours. T Th 3:35. Mr. Siegel.

A survey of cultures of Indonesia, Malaysia, and the Philippines with attention focused on social organization, ritual, belief, and forms of cultural expression. Selected societies will be studied in some detail.

435. ETHNOLOGY OF MAINLAND SOUTHEAST ASIA

Fall term. Credit four hours. T Th 3:35. Mr. Sharp.

A survey of the development and distribution of major cultural systems and a study of selected highland cultures and lowland civilizations in southern China, Assam, Burma, Thailand, Laos, Cambodia, and Vietnam. The fate of traditional cultural behaviors following the expansion of Chinese, Indian, Moslem, and Western civilizations into these areas.

436. ETHNOLOGY OF OCEANIA

Fall term. Credit four hours. M W F 10:10. Mr. B. Lambert.

A survey of native cultures of Polynesia, Micronesia, Melanesia, and Australia, with emphasis on topics of general interest to social anthropologists. The settlement and prehistory of the area will also be discussed.

438. ETHNOLOGY OF AFRICA

Spring term. Credit four hours. M W F 2:30.

A social and cultural survey of representative African peoples. Emphasis is placed on the comparative study of political institutions and local descent groups. Ritual beliefs and practices are considered in relation to repetitive and radical change.

441. CULTURE AND SOCIETY IN SOUTH ASIA

Fall term. Credit four hours. T Th S 9:05. Mr. Hazlehurst.

A survey of the social, economic, political, and religious institutions of the countries of South Asia. Both the traditional cultures and the changes which are taking place are considered.

[443. CHINESE CULTURE AND SOCIETY]

Fall term. Credit four hours. Not offered in 1969-70.

451. INTERPRETIVE ARCHAEOLOGY

Fall term. Credit four hours. M 1:25-3:20. Mr. Ascher.

A discussion of the dual humanistic, scientific aims of archaeology and how they may be achieved. The nature of evidence, recognition, observation, classification, experiment, quantification, and analogy in archaeological inference. Critical evaluation of attempts to reconstruct specific events, systems of knowledge, personalities, trade, migration, populations, communities, and culture history. Examples are drawn from several parts of the world and from contemporary as well as ancient communities. Laboratory and field work arranged where appropriate for individual projects.

452. SCIENCE IN ARCHAEOLOGY

Spring term. Credit four hours. Prerequisites, two years of biological or physical science; or two years of mathematics, computer science or engineering; or two years of the above in any combination. Th 1:25-3:20. Mr. Ascher.

A seminar focused on applications to archaeology of science and mathematics. Topics vary with the composition of the class, but they may include applications drawn from the biological, physical, geological, material, or computer sciences, and from mathematics, statistics, and engineering. Attention is also given to accomplishments in science and technology known from archaeological sources, for example, Stonehenge. Class readings include collaborative solutions to problems, such as the emergence of food-producing communities. Laboratory and field work on the design and construction of experimental archaeological structures.

[466. TECHNOLOGY]

Spring term. Credit four hours. Miss Treistman. Not offered in 1969-70.

471-472. PHYSICAL ANTHROPOLOGY LABORATORY

Throughout the year. Either or both terms. Credit four hours a term. Prerequisite, Anthropology 102, 304, or 372; or Biological Sciences 101-102, 103-104, 210, 270, 280, 301, 311, 361, or 362; or consent of the instructors. Th 5 10:10-12:05. Fall term: Mr. Kennedy. Spring term: Mr. Stini.

Practical exercises and demonstrations of modern approaches to the methodology of physical anthropology. Emphasis upon comparative primate anatomy, the human palaeontological record, description of skeletal and living subjects, palaeopathology, skeletal maturation, and relevant field techniques for the archaeologist.

491. HONORS SEMINAR

Fall term. Credit four hours. T 1:25-3:20. Mr. Smith and staff.

492. HONORS THESIS

Spring term. Credit four hours. Prerequisite, Anthropology 491. Hours to be arranged. Staff.

495. SOCIAL RELATIONS SEMINAR

(also Sociology 497)

Fall term. Credit four hours. Open only to seniors majoring in social relations. Hours to be arranged.

497-498. TOPICS IN ANTHROPOLOGY

Throughout the year. Either or both terms. Credit to be arranged. Prerequisite, consent of the instructor. Hours to be arranged. Staff.

Graduate Seminars

The following seminars are for graduate students but are open to qualified seniors by consent of the instructor, unless otherwise indicated. Those seminars with announced special topics, may be repeated. For descriptions, see the *Announcement of the Graduate School: Social Sciences*.

501. PROSEMINAR: THE SCOPE OF ANTHROPOLOGY

Fall term. Credit four hours. W 12:20-2:15. Mr. Cancian and staff.

502. THE DESIGN OF FIELD RESEARCH

Spring term. Credit four hours. T 1:25-3:20. Mr. Cancian.

[503. HUMAN BIOLOGY AND CULTURAL BEHAVIOR]

Fall term. Credit four hours. Mr. Stini. Not offered in 1969-70.

[504. THEORY OF CULTURE: MATHEMATICS AND CULTURAL BEHAVIOR]

Spring term. Credit four hours. Not offered in 1969-70.

507-508. SPECIAL PROBLEMS IN ANTHROPOLOGY

Either term. Credit and hours to be arranged. Staff.

511-512. HISTORY OF ANTHROPOLOGICAL THOUGHT

Throughout the year. Either or both terms. Credit four hours. W 3:35-5:30. Mr. Opler.

513. CONTEMPORARY ANTHROPOLOGICAL THEORY: BRITISH AND FRENCH

Fall term. Credit four hours. Th 3:35-5:30. Mr. B. Lambert.

[514. APPLIED ANTHROPOLOGY]

Spring term. Credit four hours. Mr. Sharp. Not offered in 1969-70.

[515. MODELS IN CULTURE]

Fall term. Credit four hours. Mr. Roberts. Not offered in 1969-70.

CROSS-CULTURAL RESEARCH METHODS

(Rural Sociology 516, College of Agriculture)

Spring term. Credit four hours. W F 1:25. Mr. Young.

517. CONCEPTUAL SYSTEMS IN ANTHROPOLOGY: EXCHANGE AND MAXIMIZATION THEORIES

Fall term. Credit four hours. T 1:25-3:20. Mr. Cancian.

518. CULTURAL PROCESSES: ROLE "THEORY" AND CULTURAL CHANGE

Spring term. Credit four hours. M 3:35-5:30. Mr. Sharp.

520. ETHNOLINGUISTICS

Spring term. Credit four hours. F 3:35-5:30. Mr. Hockett.

523. SOCIAL SYSTEMS: THE ANTHROPOLOGY OF FACE-TO-FACE INTERACTION

Spring term. Credit four hours. Th 3:35-5:30. Mr. Gregor.

528. POLITICAL ANTHROPOLOGY: SOCIAL STRUCTURE AND POLITICS

(Also Government 550)

Spring term. Credit four hours. W 3:35-5:30. Messrs. Anderson and Siegel.

[530. NORTH AMERICA]

Spring term. Credit four hours. Mr. Roberts. Not offered in 1969-70.

[531. MIDDLE AMERICA]

Fall term. Credit four hours. Mr. Cancian. Not offered in 1969-70.

[532. SOUTH AMERICA: LOWLAND RESEARCH]

Spring term. Credit four hours. Not offered in 1969-70.

534-535. SOUTHEAST ASIA: READINGS IN SPECIAL PROBLEMS

Either term. Credit and hours to be arranged. Messrs. Siegel and Sharp

539. AFRICA

Fall term. Credit four hours. Hours to be arranged.

540. SOUTH ASIA

Spring term. Credit four hours. M 3:35-5:30. Mr. Hazlehurst.

541-542. SOUTH ASIA: READINGS IN SPECIAL PROBLEMS

Either term. Credit and hours to be arranged. Messrs. Hazlehurst and Opler.

[543. CHINA]

Fall term. Credit four hours. Not offered in 1969-70.

545. JAPAN

Fall term. Credit four hours. Th 1:25-3:20. Mr. Smith.

548. COMPARATIVE STUDIES IN COMPLEX SOCIETIES: AGRARIAN CIVILIZATIONS

Spring term. Credit four hours. T 3:35-5:30. Mr. Hazlehurst.

RESEARCH IN COMPARATIVE MODERNIZATION

(Rural Sociology 550, College of Agriculture)

Throughout the year. Either or both terms. Credit and hours to be arranged. Mr. Young.

[560. PROBLEMS IN EUROPEAN ARCHAEOLOGY]

Spring term. Credit four hours. Mr. Lynch. Not offered in 1969-70.

[563. PROBLEMS IN ASIAN ARCHAEOLOGY]

Fall term. Credit four hours. Miss Treistman. Not offered in 1969-70.

[565. ARCHAEOLOGY: AGRICULTURE AND CIVILIZATION]

Fall term. Credit four hours. Prerequisite, Anthropology 364. Mr. Lynch. Not offered in 1969-70.

575. PHYSICAL ANTHROPOLOGY: PROBLEMS, METHODS AND THEORY

Fall term. Credit four hours. Th 3:35-5:30. Mr. Stini.

578. PALAEOANTHROPOLOGY: SOUTH ASIA

Spring term. Credit four hours. Th 3:35-5:30. Mr. Kennedy.

601-602. FIELD RESEARCH

Throughout the year. Either or both terms. Credit to be arranged. Staff.

COMMUNICATION AND SOCIAL SYMBOLICS

(Rural Sociology 622, College of Agriculture)

Spring term. Hours to be arranged. Mr. Young.

ARCHAEOLOGY

Mr. R. Ascher, Chairman; Messrs. A. H. Detweiler, S. W. Jacobs, D. Kagan, T. F. Lynch, Miss Elizabeth Milburn, Messrs. S. J. O'Connor, I. Rabinowitz, Miss Judith M. Treistman, Mr. F. O. Waage.

Archaeology is taught in several departments within the University. Any undergraduate, no matter what his major, may elect a *concentration* in archaeology. The provisions of the concentration are:

(a) Completion of Introduction to Archaeology with a grade of B or better. This should be accomplished not later than the second semester of the sophomore year.

(b) Completion of at least four additional courses in archaeology. The distribution should be such that the courses are selected from the offerings of two or more departments.

(c) Participation in an archaeological excavation either at a summer field school or at a research excavation approved in advance by the concentration adviser. This provision may be waived at the discretion of the adviser.

A student electing the concentration selects a concentration adviser. If the student is majoring in a department that offers archaeology, he selects his adviser from within that department. If the student is not majoring in such a department, he should consult with Mr. Ascher who will guide him in the choice of an adviser. Upon graduation, successful completion of the concentration will be noted on the student's academic record.

200. INTRODUCTION TO ARCHAEOLOGY

Fall term. Credit three hours. Open to all undergraduates whether or not they elect the concentration. T Th 1:25. Mr. Ascher, Miss Milburn.

A consideration of the essential methods and aims of archaeology. During the second half of the semester specialists from several departments will discuss a variety of problems in, and approaches to, archaeology.

[INTRODUCTION TO CLASSICAL ARCHAEOLOGY]

(Classics 220)

Not offered in 1969-70.

ANCIENT HISTORY

(History 301-302)

Throughout the year. M W F 11:15. Mr. Kagan.

PREHISTORIC ARCHAEOLOGY

(Anthropology 303)

Spring term. M W F 11:15. Mr. Lynch.

PREHISTORIC ART

(History of Art 313)

Fall term. M W F 9:05. Mr. Waage.

PRECLASSICAL GREECE

(Classics 319)

Fall term. M W F 10:10. Miss Milburn.

ARCHAEOLOGY OF CLASSICAL GREECE

(Classics 320)

Spring term. M W F 10:10. Mr. Threatte.

GREEK SCULPTURE

(History of Art 431)

Spring term. Credit four hours. Hours to be arranged. Mr. Waage.

[ARTS OF THE ROMAN EMPIRE]

(History of Art 432)

Not offered in 1969-70.

ARCHAEOLOGY OF ASIA

(Anthropology 363)

Fall term. M W F 9:05. Miss Treistman.

[ARCHAEOLOGY OF THE AMERICAS]

(Anthropology 364)

Not offered in 1969-70.

[NUMISMATICS]

(History of Art 521)

Not offered in 1969-70.

CERAMICS

(History of Art 523)

Fall term. Hours to be arranged. Mr. Waage.

[THE ANCIENT NEAR EAST]

(Architecture 430, College of Architecture, Art, and Planning)

Not offered in 1969-70.

[THE CLASSICAL WORLD]

(Architecture 431, College of Architecture, Art, and Planning)

Not offered in 1969-70.

INTERPRETIVE ARCHAEOLOGY

(Anthropology 451)

Fall term. M 1:25-3:20. Mr. Ascher.

SCIENCE IN ARCHAEOLOGY

(Anthropology 452)

Spring term. Th 1:25-3:20. Mr. Ascher.

[INTRODUCTION TO ARCHITECTURAL ASPECTS OF
ARCHAEOLOGICAL FIELDWORK]

(Architecture 460, College of Architecture, Art, and Planning)

Not offered in 1969-70.

DESIGN AND CONSERVATION

(Architecture 465; Planning 746, College of Architecture, Art, and Planning)

Fall term. Mr. Jacobs; Mr. Jones.

[SOUTHEAST ASIAN ART AND ARCHAEOLOGY]

(History of Art 588)

Not offered in 1969-70.

ASIAN STUDIES

S. J. O'Connor, Chairman; Messrs. B. R. O'G. Anderson, D. E. Ashford, K. Biggerstaff, N. C. Bodman, H. Capener, N. R. Chen, C. T. Chow, A. T. Dotson, J. M. Echols, G. H. Fairbanks, J. C. Fei, H. Feldman, J. W. Gair, F. H. Golay, A. B. Griswold, D. G. E. Hall, L. W. Hazlehurst, M. Hugo-Brunt, R. B. Jones, Jr., G. McT. Kahin, G. B. Kelley, K. A. R. Kennedy, M. Leifer, T. C. Liu, J. McCoy, J. W. Mellor, D. Mozingo, M. E. Opler, C. A. Peterson, R. A. Polson, R. M. Quinn, H. Shadick, L. Sharp, J. T. Siegel, R. J. Smith, Mrs. Etsuko Terasaki, Miss Judith Treistman, Messrs. J. U. Wolff, O. W. Wolters, M. W. Young.

The applicant for admission to the major in Asian studies must have completed at least one course selected from among those listed under the Department of Asian Studies and must be recommended by the instructor in charge of that course. He must have received a minimum grade of C in this and in all other courses taken in the Department.

The candidate for the A.B. degree with a major in Asian studies is required to complete two courses at the 200 level in one of the Asian languages offered at Cornell. The major consists of at least thirty additional hours (which may include further language work), selected by the student in consultation with his adviser, from among the courses listed under the Department of Asian Studies numbered 300 and above. Majors normally concentrate their work in at least one of the disciplines and in one of the following areas: China, Japan, South Asia, Southeast Asia.

THE HONORS PROGRAM. The candidate for Honors must maintain a cumulative average of B in courses in the humanities and social sciences. He must also maintain an average of B in courses in the Department. In his senior year, the Honors candidate will take two seminars selected from among those listed below in consultation with his adviser.

The Honors candidate will also take the Honors course (Asian Studies 401) in which he writes his Honors paper. He may also enroll in Asian Studies 402 in his senior year, but this course is not required of

him. At the end of his junior year, the student should consult with the professor with whom he plans to write his paper, to obtain permission to register for the Honors course. There will be a comprehensive written examination in May of his senior year, administered by the supervisor of his Honors work.

Asia, General

ECONOMICS OF AGRICULTURAL DEVELOPMENT

(Agricultural Economics 464, College of Agriculture) Spring term. T Th S 9:05. Mr. Mellor.

[SEMINAR ON THE ECONOMICS OF TROPICAL AGRICULTURE]

(Agricultural Economics 667, College of Agriculture) Fall term. F 2:30-4:25. Mr. Poleman. Not offered in 1969-70.

COMMUNICATION IN THE DEVELOPING NATIONS

(Communication Arts 524, College of Agriculture) Fall term. M W F 11:15. Mr. Crawford.

COMPARATIVE RURAL SOCIETIES

(Rural Sociology 420, College of Agriculture) Fall term. M W F 11:15. Mr. Polson.

APPLICATIONS OF SOCIOLOGY TO DEVELOPMENT PROGRAMS

(Rural Sociology 528, College of Agriculture) Spring term. M W F 11:15-12:30. Mr. Polson.

ARCHAEOLOGY OF ASIA

(Anthropology 363) Fall term. M W F 9:05. Miss Treistman.

[PROBLEMS IN ASIAN ARCHAEOLOGY]

(Anthropology 563) Fall term. T 3:35-5:30. Miss Treistman. Not offered in 1969-70.

ARCHITECTURE AND PLANNING IN THE ORIENT

(Architecture 435, College of Architecture, Art, and Planning) Fall term. M W F 11:15. Mr. Hugo-Brunt.

COMPARATIVE REVOLUTIONS

(Government 350) Fall term. T Th 1:25-3:00. Mr. Mozingo.

THE UNITED STATES AND ASIA

(Government 377) Spring term. M W F 9:05. Mr. Kahin.

SEMINAR IN THE INTERNATIONAL RELATIONS OF ASIA

(Government 577) Fall term. Hours to be arranged. Mr. Kahin.

SELECTED TRADITIONS IN ASIAN ART

(History of Art 281) Spring term. T Th S 10:10. Mr. O'Connor.

[THE ARTS OF INDIA AND SOUTHEAST ASIA]

(History of Art 386) Fall term. M W F 10:10. Mr. O'Connor. Not offered in 1969-70.

401. ASIAN STUDIES HONORS COURSE

Either term. Credit four hours. Staff.

This course, in which the student writes an Honors essay, is required of all Honors students in their senior year. It is normally taken with the student's major adviser.

402. ASIAN STUDIES DIRECTED READING

Either term. Credit two hours. Staff.

Open only to majors in the department in their senior year; provides the student with the opportunity to read intensively in a selected area under the direction of a member of the staff.

591-592. SEMINAR: FIELD RESEARCH

Throughout the year. Staff.

For description see the *Announcement of the Graduate School: Social Sciences*.

China

AREA COURSES

[CHINESE CULTURE AND SOCIETY]

(Anthropology 443) Fall term. Not offered in 1969-70.

[SEMINAR: CHINA]

(Anthropology 543) Fall term. Not offered in 1969-70.

[INTRODUCTION TO THE ECONOMY OF CHINA]

(Economics 369) Fall term. T Th S 9:05. Mr. Chen. Not offered in 1969-70.

[SEMINAR: THE ECONOMY OF CHINA]

(Economics 676) Spring term. Hours to be arranged. Mr. Chen. Not offered in 1969-70.

MAJOR SEMINAR

(Government 300) Either term. Hours to be arranged. Mr. Mozingo.

CHINESE GOVERNMENT AND POLITICS

(Government 347) Fall term. T Th S 11:15.

THE FOREIGN POLICY OF CHINA

(Government 478) Spring term. T Th 2:30-4:00. Mr. Mozingo.

SUPERVISED READINGS

(Government 499) Either term. Hours to be arranged. Mr. Mozingo.

SEMINAR IN THE POLITICS OF CHINA

(Government 547) Spring term. Hours to be arranged.

[COMPARATIVE COMMUNISM]

(Government 548) Spring term. Hours to be arranged. Messrs. Mozingo and Rush. Not offered in 1969-70.

SEMINAR IN COMMUNIST CHINA IN INTERNATIONAL POLITICS
(Government 583) Fall term. Hours to be arranged. Mr. Mozingo.

HISTORY OF CHINESE CIVILIZATION PRIOR TO THE NINETEENTH
CENTURY

(History 323) Fall term. T Th S 10:10. Mr. Peterson.

HISTORY OF CHINESE CIVILIZATION: NINETEENTH AND
TWENTIETH CENTURIES

(History 324) Spring term. T Th S 10:10. Mr. Biggerstaff.

CHINESE HISTORY: T'ANG AND SUNG PERIODS

(History 492) Spring term. T Th 1:25-3:20. Mr. Peterson.

SUPERVISED READING

(History 511-512) Throughout the year. Hours to be arranged. Staff.

CHINESE HISTORIOGRAPHY AND SOURCE MATERIAL

(History 591) Fall term. Hours to be arranged. Mr. Peterson.

MODERNIZATION OF CHINA

(History 593) Spring term. M 3:35-5:30. Mr. Biggerstaff.

[MODERNIZATION OF CHINA]

(History 594) Not offered in 1969-70.

SEMINAR IN MEDIEVAL CHINESE HISTORY

(History 691-692) One or two terms. Hours to be arranged. Mr. Peterson.

SEMINAR IN MODERN CHINESE HISTORY

(History 693-694) One or two terms. Hours to be arranged. Mr. Biggerstaff.

ART OF CHINA

(History of Art 383) Fall term. M W F 1:25 and an additional hour to be
arranged. Mr. Young.

[PROBLEMS IN CHINESE ART]

(History of Art 584) Spring term. W 1:25-3:20. Mr. Young. Not offered in
1969-70.

[STUDIES IN CHINESE PAINTING]

(History of Art 586) Spring term. W 1:25-3:20. Mr. Young. Not offered in
1969-70.

SINO-TIBETAN LINGUISTICS

(Linguistics 581-582)

CHINESE HISTORICAL AND PHILOSOPHICAL LITERATURE

(Comparative Literature 371) Fall term. M W F 10:10. Mr. Shadick.

CHINESE IMAGINATIVE LITERATURE

(Comparative Literature 372) Spring term. M W F 10:10. Mr. Shadick.

Other courses dealing extensively with China are Anthropology 363,

563; Economics 371; Government 377, 577; History of Art 281; Architecture 435, and Planning 705 (College of Architecture, Art, and Planning).

LANGUAGE COURSES

BASIC COURSE

(Chinese 101-102)

ELEMENTARY HOKKIEN CHINESE

(Chinese 131H-132H)

[ELEMENTARY CANTONESE]

(Chinese 131C-132C) Not offered in 1969-70.

[INTERMEDIATE CANTONESE]

(Chinese 133C-134C) Not offered in 1969-70.

INTERMEDIATE CHINESE I

(Chinese 201-202)

INTRODUCTION TO CLASSICAL CHINESE

(Chinese 213)

INTERMEDIATE CHINESE II

(Chinese 301-302)

INTERMEDIATE CLASSICAL CHINESE

(Chinese 312)

CHINESE HISTORICAL AND PHILOSOPHICAL TEXTS

(Chinese 313)

HISTORY OF THE CHINESE LANGUAGE

(Chinese 402)

LINGUISTIC STRUCTURE OF CHINESE

(Chinese 403)

ADVANCED READINGS IN MODERN CHINESE

(Chinese 411-412)

CLASSICAL CHINESE PROSE

(Chinese 414)

CLASSICAL CHINESE POETRY AND DRAMA

(Chinese 416)

READINGS IN THE TRADITIONAL CHINESE NOVEL

(Chinese 420)

DIRECTED READING

(Chinese 421-422)

ADVANCED READINGS IN CLASSICAL CHINESE

(Chinese 521-522)

SEMINAR IN CHINESE LITERATURE
(Chinese 571-572)

Japan

AREA COURSES

SEMINAR: JAPAN

(Anthropology 545) Fall term. Th 1:25-3:20. Mr. Smith.

[ART OF JAPAN]

(History of Art 384) Spring term. M W F 11:15. Mr. Young. Not offered in 1969-70.

JAPANESE LITERATURE

(Comparative Literature 375-376) Throughout the year. M W F 11:15. Mrs. Terasaki.

[LINGUISTIC STRUCTURE OF JAPANESE]

(Japanese 404) Spring term. M W F 2:30. Mr. McCoy. Not offered in 1969-70.

Other courses dealing extensively with Japan are Anthropology 363, 563; Government 377, 577; History of Art 281; Architecture 435, and Planning 705 (College of Architecture, Art, and Planning).

LANGUAGE COURSES

BASIC COURSE

(Japanese 101-102)

INTERMEDIATE JAPANESE

(Japanese 201-202)

SELECTED READINGS IN JAPANESE

(Japanese 301-302)

INTRODUCTION TO CLASSICAL JAPANESE

(Japanese 305-306)

[JAPANESE READING FOR STUDENTS OF CHINESE]

(Japanese 401-402) Not offered in 1969-70.

ADVANCED READINGS IN JAPANESE

(Japanese 405-406)

South Asia

AREA COURSES

SEMINAR: THE AGRICULTURAL DEVELOPMENT OF SOUTH ASIA
(Agricultural Economics 664, College of Agriculture) Spring term. Hours to be arranged. Mr. Mellor.

COMPARATIVE RELIGIOUS SYSTEMS: SOUTH ASIA

(Anthropology 322) Spring term. M W F 10:10. Mr. Opler.

CULTURE AND SOCIETY IN SOUTH ASIA

(Anthropology 441) Fall term. T Th S 9:05. Mr. Hazlehurst.

SEMINAR: SOUTH ASIA

(Anthropology 540) Spring term. M 3:35-5:30. Mr. Hazlehurst.

SOUTH ASIA: READINGS IN SPECIAL PROBLEMS

(Anthropology 541-542) Either term. Hours to be arranged. Messrs. Hazlehurst and Opler.

PALAEOANTHROPOLOGY: SOUTH ASIA

(Anthropology 578) Spring term. Th 3:35-5:30. Mr. Kennedy.

[HISTORY OF HINDI]

(Hindi 401) Fall term in alternate years. Hours to be arranged. Mr. Fairbanks. Not offered in 1969-70.

SEMINAR IN HINDI LINGUISTICS

(Hindi 600) Either term. Hours to be arranged. Messrs. Fairbanks, Gair or Kelley.

INDIA AS A LINGUISTIC AREA

(Linguistics 331) Fall term in alternate years. Hours to be arranged. Messrs. Fairbanks, Gair or Kelley.

INDO-ARYAN STRUCTURES

(Linguistics 432) Spring term. Hours to be arranged. Mr. Gair.

DRAVIDIAN STRUCTURES

(Linguistics 436) Spring term in alternate years. Hours to be arranged. Mr. Kelley.

[COMPARATIVE INDO-EUROPEAN LINGUISTICS]

(Linguistics 521-522) Throughout the year, in alternate years. Hours to be arranged. Mr. Fairbanks. Not offered in 1969-70.

[ELEMENTARY PALI]

(Linguistics 530) Either term as needed. Hours to be arranged. Mr. Gair. Not offered in 1969-70.

ELEMENTARY SANSKRIT

(Linguistics 531-532) Throughout the year in alternate years. Credit three hours a term. T 1:25-3:20. Mr. Fairbanks.

[COMPARATIVE INDO-ARYAN]

(Linguistics 534) Spring term in alternate years. Hours to be arranged. Mr. Fairbanks. Not offered in 1969-70.

[COMPARATIVE DRAVIDIAN]

(Linguistics 536) Spring term in alternate years. Hours to be arranged. Mr. Kelley. Not offered in 1969-70.

SEMINAR

(Linguistics 600) Each term. Hours to be arranged. Various members of the staff.

DIRECTED RESEARCH

(Linguistics 615-616)

Other courses dealing extensively with South Asia are Anthropology 363, 563; Economics 371; Government 377 and 577; History of Art 281, 386; Agricultural Economics 464, 667; and Rural Sociology 420, 528 (College of Agriculture).

LANGUAGE COURSES

BASIC COURSE

(Hindi 101-102) M-F 9:05, T Th 10:10.

HINDI READING

(Hindi 201-202)

HINDI COMPOSITION AND CONVERSATION

(Hindi 203-204)

READINGS IN HINDI LITERATURE

(Hindi 301-302)

ADVANCED COMPOSITION AND CONVERSATION

(Hindi 303-304)

ADVANCED HINDI READINGS

(Hindi 305-306)

BASIC COURSE

(Sinhalese 101-102)

SINHALESE READING

(Sinhalese 201-202)

BASIC COURSE

(Telugu 101-102)

TELUGU READING

(Telugu 201-202)

BASIC COURSE

(Urdu 101-102)

URDU READING

(Urdu 201-202)

Southeast Asia

AREA COURSES

ETHNOLOGY OF ISLAND SOUTHEAST ASIA

(Anthropology 434) Spring term. T Th 3:35. Mr. Siegel.

ETHNOLOGY OF MAINLAND SOUTHEAST ASIA

(Anthropology 435) Fall term. T Th 3:35. Mr. Sharp.

POLITICAL ANTHROPOLOGY: SOCIAL STRUCTURE AND POLITICS

(Anthropology 528 and Government 550) Spring term. W 3:35-5:30. Messrs. Anderson and Siegel.

SOUTHEAST ASIA: READINGS IN SPECIAL PROBLEMS

(Anthropology 534-535) Either term. Hours to be arranged. Messrs. Siegel and Sharp.

[ECONOMIC POLICY AND DEVELOPMENT IN SOUTHEAST ASIA]

(Economics 365) Fall term. M W F 9:05. Mr. Golay. Not offered in 1969-70.

[SEMINAR: ECONOMIC GROWTH IN SOUTHEAST ASIA]

(Economics 678) Spring term. Hours to be arranged. Mr. Golay. Not offered in 1969-70.

GOVERNMENT AND POLITICS OF SOUTHEAST ASIA

(Government 344) Fall term. T Th 2:30-4:00. Mr. Anderson.

POLITICAL ROLE OF THE MILITARY

(Government 349) Spring term. M W 2:30-3:45. Mr. Anderson.

SUPERVISED SENIOR TUTORIALS

(Government 493) Fall term. Hours to be arranged. Staff.

SUPERVISED HONORS THESIS

(Government 494) Spring term. Hours to be arranged. Staff.

SEMINAR IN POLITICAL PROBLEMS OF SOUTHEAST ASIA

(Government 644) Spring term. Hours to be arranged. Mr. Kahin.

SOUTHEAST ASIAN HISTORY TO THE FOURTEENTH CENTURY

(History 495) Fall term. T Th S 11:15. Mr. Wolters.

SOUTHEAST ASIAN HISTORY FROM THE FIFTEENTH CENTURY

(History 496) Spring term. T Th S 11:15. Mr. Wolters.

SUPERVISED READING

(History 511-512) Throughout the year. Hours to be arranged. Mr. Wolters.

SEMINAR IN SOUTHEAST ASIAN HISTORY

(History 695-696) Either or both terms. Hours to be arranged. Mr. Wolters.

[SOUTHEAST ASIAN ART AND ARCHAEOLOGY]

(History of Art 588) Fall term. W 1:25-3:20. Mr. O'Connor. Not offered in 1969-70.

FIELD METHODS AND LINGUISTIC TYPOLOGY

(Linguistics 507-508) Throughout the year. M W F 9:05. Mr. Jones.

[OLD JAVANESE]

(Linguistics 537-538) Throughout the year. Hours to be arranged. Mr. Echols. Not offered in 1969-70.

SEMINAR IN SOUTHEAST ASIAN LANGUAGES

(Linguistics 571-572) Throughout the year. Hours to be arranged. Mr. Jones.

MALAYO-POLYNESIAN LINGUISTICS

(Linguistics 573-574) Throughout the year. Hours to be arranged. Mr. Wolff.

CONTRASTIVE VIETNAMESE AND CHINESE GRAMMAR

(Linguistics 583) Either term. Hours to be arranged. Mr. Quinn.

SOUTHEAST ASIAN LITERATURE

(Comparative Literature 379) Fall term. T 2:30-4:25. Mr. Echols.

501-502. SOUTHEAST ASIA

Throughout the year. Credit four hours. F 3:35-5:30, or to be arranged. Fall term (Cambodia), Mr. Leifer; spring term (Vietnam), Visiting staff.

For full description see the *Announcement of the Graduate School: Social Sciences*.

506. SEMINAR: CONTEMPORARY VIETNAM

Fall term. Credit four hours. Open to graduate students and seniors with consent of the instructor. Hours to be arranged. Visiting staff.

676. SOUTHEAST ASIAN RESEARCH TRAINING SEMINAR

Spring term. Credit to be arranged. Open only to advanced graduate students preparing for fieldwork in Southeast Asia. Hours to be arranged. Staff.

Other courses dealing extensively with Southeast Asia are Communication Arts 524 (College of Agriculture); Economics 371, 571; Government 377, 577; History of Art 281, 386; Architecture 435 and Planning 705, 707 (College of Architecture, Art, and Planning); Agricultural Economics 464, 667; and Rural Sociology 420, 528 (College of Agriculture).

LANGUAGE COURSES

BASIC COURSE

(Burmese 101-102)

BURMESE READING

(Burmese 201-202)

BURMESE COMPOSITION AND CONVERSATION

(Burmese 203-204)

ADVANCED BURMESE READING

(Burmese 301-302)

BASIC COURSE

(Cebuano [Bisayan] 101-102)

BASIC COURSE

(Indonesian 101-102)

INDONESIAN READING

(Indonesian 201-202)

INDONESIAN COMPOSITION AND CONVERSATION

(Indonesian 203-204)

READINGS IN INDONESIAN AND MALAY

(Indonesian 301-302)

ADVANCED INDONESIAN CONVERSATION AND COMPOSITION

(Indonesian 303-304)

ADVANCED READINGS IN INDONESIAN AND MALAY LITERATURE

(Indonesian 305-306)

LINGUISTIC STRUCTURE OF INDONESIAN

(Indonesian 403)

ELEMENTARY JAVANESE

(Javanese 131-132)

INTERMEDIATE JAVANESE

(Javanese 133-134)

[OLD JAVANESE]

(Linguistics 537-538)

Not offered in 1969-70.

BASIC COURSE

(Tagalog 101-102)

READING AND CONVERSATION

(Tagalog 201-202)

LINGUISTIC STRUCTURE OF TAGALOG

(Tagalog 403)

BASIC COURSE

(Thai 101-102)

THAI READING

(Thai 201-202)

THAI COMPOSITION AND CONVERSATION

(Thai 203-204)

ADVANCED THAI

(Thai 301-302)

THAI LITERATURE

(Thai 305-306)

DIRECTED INDIVIDUAL STUDY

(Thai 405-406)

BASIC COURSE

(Vietnamese 101-102)

VIETNAMESE READING

(Vietnamese 201-202)

VIETNAMESE COMPOSITION AND CONVERSATION

(Vietnamese 203-204)

ADVANCED VIETNAMESE

(Vietnamese 301-302)

VIETNAMESE LITERATURE

(Vietnamese 305-306)

DIRECTED INDIVIDUAL STUDY

(Vietnamese 405-406)

ASTRONOMY

Mr. F. D. Drake, Chairman; Messrs. T. Gold, M. O. Harwit, C. Hazard, C. Sagan, E. E. Salpeter, R. W. Shaw, Y. Terzian, R. Wagoner.

Undergraduates interested in graduate work in astronomy should major in either physics or mathematics, and take astronomy courses as electives. Graduate students must register with the instructor in charge of the desired course on regular registration days at the beginning of each term.

DISTRIBUTION REQUIREMENT. The Distribution requirement in physical sciences is met in Astronomy 201-202.

201. INTRODUCTION TO ASTRONOMY

Fall term. Credit four hours. Lectures, M W F 9:05. Laboratory, M T Th F 2-4:25. Mr. Shaw.

Fundamentals of astronomy with emphasis on the planets, moon, comets, meteors, the solar system as a unit. Telescopes. Night observation at Fuertes Observatory. Intended as a base for those interested in careers in astronomy and as a survey for students from other fields.

202. INTRODUCTION TO ASTRONOMY

Spring term. Credit four hours. Astronomy 201 is not prerequisite to Astronomy 202. M W F 9:05. Laboratory, M T Th or F 2-4:25. Mr. Shaw.

Fundamentals of astronomy with emphasis on the sun, stars, the galaxy, the sidereal universe. Spectroscopy. Night observation at Fuertes Observatory. Suitable for those interested in careers in astronomy and as a survey for students from other fields.

305. CELESTIAL NAVIGATION

Spring term. Credit three hours. M W F 11:15. Prerequisite, consent of the instructor. Mr. Shaw.

Celestial and space navigation. Theory of position determination on sea, in air, and in space. Air and Nautical Almanacs. Day and night practice with marine, standard bubble, and automatic sextants. Chart work.

332. ELEMENTS OF ASTROPHYSICS

Spring term. Credit three hours. Prerequisites, calculus and a course in modern physics. M W F 10:10. Mr. Terzian.

Topics to be covered will include: Size, mass and age of stars, galaxies, and the Universe; stellar evolution and the formation of heavy chemical elements; interstellar matter and star formation.

340. SPECIAL TOPICS IN ASTRONOMY

Either term. Credit two or four hours. Prerequisite, consent of the instructor. Mr. Shaw.

Instruction in selected topics for qualified students according to their needs and preparation. Observational techniques and instrumentation. Binary stars, orbital computation, coordinate measurement, photometry, and spectroscopy. Special attention to the problems of science teachers.

431. INTRODUCTION TO ASTROPHYSICS

Fall term. Credit three hours. Prerequisites, Physics 225, 226, and 303 or the equivalent. M W F 10:10.

Dynamics of planetary and stellar systems. Stellar structure and evolution. Binary, variable and peculiar stars. Nuclear synthesis in stars. Stellar atmospheres. Abundance of the chemical elements.

432. INTRODUCTION TO SPACE PHYSICS

Spring term. Credit three hours. Prerequisites, Astronomy 431 or consent of the instructor. M W F 10:10.

Interstellar dust and gas. Evolution of the Stromgren sphere. Star formation. Interstellar magnetic fields, cosmic rays and radio emission. Interplanetary gas and dust. Comets, meteorites, and micrometeorites.

For complete descriptions of the following graduate courses see the *Announcement of the Graduate School: Physical Sciences*.

510. COSMOLOGY AND EVOLUTION

520. RADIO ASTRONOMY I

521. RADIO ASTRONOMY II

530. NUCLEAR ASTROPHYSICS

531. COSMIC RAYS

532. PHYSICS OF THE MAGNETOSPHERE

540. ADVANCED STUDY AND RESEARCH

550. INTERSTELLAR MATTER

560. THEORY OF STELLAR STRUCTURE AND EVOLUTION

570. PHYSICS OF THE PLANETS

571. SPECIAL PROBLEMS IN PLANETARY ASTRONOMY

BIOLOGICAL SCIENCES

Dr. Robert S. Morison, Director; Messrs. M. Alexander, H. W. Ambrose, J. M. Anderson, H. P. Banks, J. P. Barlow, D. M. Bates, C. O. Berg, A. W. Blackler, W. L. Brown, T. J. Cade, J. M. Calvo, J. M. Camhi, L. E. Carmichael, R. T. Clausen, R. K. Clayton, L. C. Cole, C. L. Comar, Miss Louise J. Daniel, Messrs. E. A. Delwiche, W. C. Dilger, W. J. Dress,

S. J. Edelstein, T. Eisner, S. T. Emlen, H. L. Everett, P. P. Feeny, Mrs. June M. Fessenden-Raden, Messrs. G. R. Fink, E. L. Gasteiger, J. L. Gaylor, Mrs. A. Jane Gibson, Messrs. Q. H. Gibson, P. W. Gilbert, J. H. Gillespie, R. J. Guillory, B. P. Halpern, G. G. Hammes, W. Hansel, L. A. Heppel, G. P. Hess, H. C. Howland, J. W. Hudson, J. W. Ingram, Jr., A. T. Jagendorf, W. T. Keeton, Miss Elizabeth B. Keller, Messrs. J. M. Kingsbury, R. P. Korf, D. A. Lancaster, E. R. Lemon, E. H. Lenneberg, S. L. Leonard, R. E. MacDonald, R. J. MacIntyre, R. E. McCarty, D. B. McCormick, W. N. McFarland, L. N. Miller, H. E. Moore, H. B. Naylor, A. L. Neal, W. L. Nelson, R. D. O'Brien, D. Pimentel, F. H. Pough, Jr., E. Racker, E. C. Raney, D. S. Robson, R. B. Root, F. Rosenblatt, M. Salpeter, G. Schatz, H. A. Scheraga, H. W. Seeley, Jr., L. I. Slobin, R. Spanswick, A. M. Srb, F. C. Steward, H. T. Stinson, E. L. Stone, D. N. Tapper, J. F. Thompson, B. V. Travis, C. H. Uhl, L. D. Uhler, P. J. VanDemark, A. vanTienhoven, W. J. Visek, B. Wallace, J. W. Wells, D. C. Wharton, J. H. Whitlock, R. H. Whittaker, H. H. Williams, D. B. Wilson, W. A. Wimsatt, L. D. Wright, R. Wu, S. A. Zahler, D. B. Zilversmit.

Students will be provisionally accepted in the biological sciences specialization as established by the Division of Biological Sciences during their freshman year or the first term of the sophomore year. Final admission to the specialization will require completion of (1) a year of biology (Biological Sciences 101-102 or 103-104); (2) a year of general chemistry (preferably Chemistry 107-108); and (3) a year of calculus (Mathematics 111-112, 111-122, or 107-108). Whenever possible, the student should include the above three subjects in his freshman schedule and complete organic chemistry and genetics in the sophomore year. It is also advisable for students anticipating a concentration in biochemistry or physiology to complete Physics 207-208 in the sophomore year, and all students should consider doing so. A student is not encouraged to undertake a specialization in biological sciences unless his performance in the above courses gives evidence of capacity to do satisfactory work at a more advanced level.

In addition to the introductory courses in chemistry, biological sciences, and mathematics, each major student must complete the following: (1) Chemistry 353-355 (or 355-356 and 357-358), (2) a year of physics (preferably Physics 207-208, but 101-102 is also accepted), (3) Biological Sciences 281 (Genetics), (4) Biological Sciences 431 (or 531-532) (Biochemistry), (5) the breadth requirement outlined below, (6) one of the concentration areas outlined below.

The breadth requirement is designed to insure that each major student becomes familiar with a minimum number of different aspects of modern biology. In fulfillment of this requirement, each student must pass one of the listed courses in two of the following eight categories: (1) *Neurobiology and Behavior*: Biological Sciences 320, 421; Psychology 201, 323 (2) *Developmental Biology*: Biological Sciences 347, 385 (3) *Ecology and Evolution*: Biological Sciences 361, 475 (4) *Microbiology*: Biological Sciences 290A (5) *Morphology*: Biological Sciences 311, 313, 316, 345 (6) *Physical Science and Mathematics*: Chemistry 236, 389;

Geology 101; Mathematics 213 or 221; Statistics 410 (7) *Physiology*: Biological Sciences 240, 410 414 (8) *Taxon-oriented Courses*: Biological Sciences 270, 316, 371, 344; Entomology 212; Plant Pathology 309.

The concentration requirement is designed to help the student achieve depth in some area of biology of his own choosing. It permits maximum flexibility, while insuring that the selection of advanced courses will form a coherent and meaningful unit. The student should seek the advice of his adviser in selecting the courses he will take in fulfillment of both the breadth and concentration requirements. The possible concentration areas are:

(1) *Animal Physiology and Anatomy*: Twelve hours, usually selected from the following: Biological Sciences 311, 313, 316, 385, 410, 410A, 412, 414, 419, 512; Animal Science 427-428; Poultry Science 425, 520; Veterinary Medicine 924.

(2) *Neurobiology and Behavior*: Biological Sciences 320 and eleven hours to be selected in consultation with the adviser.

(3) *Biochemistry*: The student must fulfill the organic chemistry and biochemistry core requirements by taking Chemistry 355, 356, 357, 358 and Biological Sciences 431 (or 531-532). Chemistry 236 must be taken under the breadth requirement unless Chemistry 116 was taken. In addition, the student should take Chemistry 287-288 (or 279, 389-390) and Biological Sciences 432 (or 533).

(4) *Botany*: Usually Biological Sciences 240, 371, 345 and 347 (two of these courses may be selected under the breadth requirement).

(5) *Ecology and Evolution*: At least fourteen hours, selected in consultation with an adviser. A course in introductory ecology, a course in systematics, and a course in physiology must be included here or under the breadth requirement.

(6) *Genetics and Development*: Nine hours, usually selected from the following: Biological Sciences 280, 347, 385, 440, 475, 482, 489, 495, 495A, 584, 586; Statistics 410; Plant Breeding 515.

(7) *Microbiology*: Biological Sciences 290, which may be selected under the breadth requirement, plus twelve hours in courses in basic microbiology, including at least two with a laboratory (such as 390B, 490B, 495B; Veterinary Medicine 340).

Students who, for good reason, wish to undertake a course of studies not covered by these seven concentration areas may petition for permission to do so.

Students interested in teaching biology in secondary schools may specialize in biological sciences for the B.S. degree and then complete the requirements for the M.A.T. (Master of Arts in Teaching) degree during a fifth year in the Dept. of Education. The fifth year includes one semester of graduate study in the sciences, a summer of preparation for teaching, and one semester of internship in a secondary school. Stipends and fellowship support are available to selected candidates in the fifth year. Students interested in the five-year program leading to secondary school teaching are urged to consult their adviser and an adviser in the Dept. of Education during their freshman year.

THE HONORS PROGRAM. An Honors program offers the superior student an opportunity to do independent work under the supervision of a member of the Division. This usually entails independent laboratory work on a project in addition to writing a thesis. Candidates for this program must have at least a 2.7 cumulative average with a 3.0 average in the sciences and obtain a sponsor within the Division. An Honors candidate may enroll in research courses offered by his sponsor. No more than four credit hours of research courses can be used for completion of the requirements in the area of concentration. Recommendation to the faculty that a candidate graduate with Honors will be the responsibility of the Honors Program Committee. Students interested should consult their adviser for further details, preferably during the first term of the junior year.

Registration for the Honors program can be no later than the first term of the senior year. The final report of the student's work must be in the hands of the committee not later than the first day of the study period prior to week of the final examinations.

DISTRIBUTION REQUIREMENT. The Distribution requirement in biological sciences for nonmajors is satisfied by Biological Sciences 101-102 or 103-104. A student may qualify for advanced standing credit and/or placement in biological science by superior performance on the Advanced Placement Examination in biology or on a special placement examination to be given at entrance to students who present evidence of particularly thorough training in the subject.

General Courses

101-102. BIOLOGICAL SCIENCES

Throughout the year. Credit three hours a term. Biological Sciences 101 is prerequisite to Biological Sciences 102, unless special permission is obtained from the instructor. 101-102 cannot be taken for credit after 103-104. Lectures, M W 8, or M W 10:10. Laboratory, M T W Th or F 1:30-4:25, or Th F or S 8-11, or T Th or F 10:10-1:00, or S 9:05-11:55, or M T W 7:30-10:20 P.M. Two preliminary examinations will be given each term at 7:30 in the evening. Messrs. Keeton, Ambrose, Camhi, Zollinhofer, guest lecturers, and assistants.

Designed both for students who intend to specialize in biological sciences and for those specializing in other subjects, such as the social sciences or humanities, who want to obtain a thorough knowledge of biology as part of their general education. Plant and animal materials are considered together rather than in separate units. The fall semester covers cellular biology, the biochemistry of metabolism, physiology and anatomy, and behavior. The spring semester includes genetics, developmental biology, evolutionary theory, the biology of populations and communities, the origin of life, and evolutionary patterns in the plant and animal kingdoms. Each topic is considered in the light of modern evolutionary theory.

The course will include a series of guest lectures by outstanding faculty members of the University, lecturing on their own field of research. The intent is to acquaint students with the excitement and promise of modern biological research, both basic and applied, and, more particularly, with the research being done at Cornell.

103-104. PLANT AND ANIMAL BIOLOGY

Throughout the year. Credit three hours a term. Limited to 500 students. Certain students in Agriculture may take Biological Sciences 106 instead of Biological Sciences 104, but this substitution does not fulfill the requirement for admission to a Biological Sciences major. 103-104 cannot be taken for credit after 101-102. 103 is prerequisite to 104 unless special consent is obtained from the instructor. Lectures, T Th 9:05 or 11:15. Laboratory, M T W Th or F 1:25-4:25, or M or T 10:10-1:10, or S 8-11 or 10:10-1:10. Two preliminary examinations will be given each term at 7:30 in the evening; the dates are: October 21 and December 2, 1969 and March 9 and April 22, 1970. Fall term, Mr. Banks; spring term, Mr. Leonard.

Designed to give students an understanding of the growth, development and evolution of plants and animals and their role in nature. This integrated course provides the basic knowledge necessary for those who intend to specialize in some aspect of plant or animal sciences.

Plant biology (fall term) emphasizes the dynamic aspects of plant function, structure, growth and evolution. In laboratory, emphasis is placed on experimentation and analysis of living material. One period is devoted to field work. Biological principles are developed from a firsthand study of specific organisms and their function and interrelationships.

Animal biology (spring term) deals with the functional aspects of organ systems of animals beginning with the more familiar forms which serve as a point of reference. Material will include an introduction to the biochemical features of metabolism and regulatory control. Representatives of the major phyla will be used to illustrate biological principles.

106. INTERMEDIATE PLANT BIOLOGY

Spring term. Credit three hours. No specific prerequisite, but most students will have had at least Biological Sciences 103 or its equivalent. Lectures, T Th 9:05. Laboratory, M T or W 1:25-4:25. Mr. Banks.

Designed to provide a basic understanding of the structure, function, reproduction, and relationships of representatives from diverse plant groups. Intended for those who intend to specialize in some aspect of the plant sciences. Wherever possible students will be involved in the field collection of their own laboratory materials. Students will be encouraged to carry out a project of their own choice, possibly in collaboration with staff members in Botany or in allied plant science departments.

301. LABORATORY METHODS IN BIOLOGY

Either term. Credit three hours. Prerequisites, Biological Sciences 101-102 or 103-104. Limited to juniors, seniors, and graduate students; twenty students per section. Lecture-laboratory, T or F 10:10-12:35. Additional periods by appointment. Mr. Uhler.

For students who intend to teach or to follow some phase of biology as a profession. Subjects covered: collection, preservation, and storage of materials; the preparation of bird and mammal study skins; injection of circulatory systems with latex; clearing and staining of small vertebrates; and the preparation and staining of smears, whole mounts, and sections.

MATHEMATICAL AND STATISTICAL MODELS IN BIOLOGY

(Statistics and Biometry 410, College of Agriculture)

401. TEACHING BIOLOGY

Either term. Credit four hours. Prerequisite, consent of the instructor; enrollment limited. Hours to be arranged. Mr. Camhi.

Discussions of recent developments in the teaching of biology, and participation in teaching elementary biology at the college level.

409. RESEARCH IN BIOLOGY

Either term. Credit to be arranged. Undergraduates must attach to their pre-registration material written permission from the staff member who will supervise the work and assign the grade. Hours to be arranged. Staff.

Practice in planning, conducting, and reporting independent laboratory and/or library research programs.

600. SEMINAR: CURRENT TOPICS IN MODERN BIOLOGY

Either term. Credit one hour per topic (two topics per term). Open to juniors and seniors in the Division of Biological Sciences upon consent of instructors. Hours to be arranged. Staff.

For each topic, a group of selected papers from the literature will be critically evaluated during six or seven two-hour meetings. Topics may include control mechanisms, protein structure, behavior, immunochemistry, molecular genetics, membranes, developmental genetics and photosynthesis. If you are interested, attend an organizational meeting Monday, September 15 at 12:20 P.M. in 345 Warren. Do not register for Biological Sciences 600 before attending this meeting.

602. SEMINAR FOR M.S.T. DEGREE CANDIDATES

Spring term. Credit one hour. Hours to be arranged. Mr. Uhler.

Discussion and evaluation of new approaches to biological instruction.

Animal Physiology and Anatomy

210. HUMAN PHYSIOLOGY

Spring term. Credit three hours. No credit for Biological Sciences majors. Prerequisites, Chemistry 103 or equivalent; students must at least have taken high school courses in biology and chemistry. Lectures, M W F 8:00. Staff.

Basic concepts of human anatomy and physiology will be presented to provide the groundwork for the understanding of the functioning of the human body in health and disease. Emphasis will be placed on the relationship of human physiology to problems of public health and contemporary living. The individual systems, such as cardiovascular, gastrointestinal, neurological, endocrine, renal, etc., will be discussed singly and in correlation with each other. Guest lecturers will be invited as appropriate.

311. COMPARATIVE ANATOMY OF VERTEBRATES

Fall term. Credit four hours. Prerequisites, Biological Sciences 101-102, or 103-104. Lectures, hours to be arranged. Laboratory, M F or T Th 1:25-4:25, or T Th 8-11, or W 1:25-4:25 and S 8-11. Staff.

Dissections and demonstrations of representative vertebrate types, including fish, amphibian, reptile, bird, and mammal. Intended to give students an appreciation of man's structural heritage and some insight into the interrelationship of form and function among the vertebrates.

313. HISTOLOGY: THE BIOLOGY OF THE TISSUES

Fall term. Credit four hours. Prerequisites, a two-semester introductory biology sequence; comparative anatomy and organic chemistry or biochemistry desirable. Lectures, T Th 11:15. Laboratory, T Th 8-9:55, or 2:30-4:25. Mr. Wimsatt.

A general course dealing with the biology of the tissues to provide the student with a basis for understanding the microscopic and fine structural organization of vertebrates and the methods of analytic morphology at the cell and tissue levels. The dynamic interrelations of structure, chemical composition and function in cells and tissues are stressed.

316. INVERTEBRATE ZOOLOGY

Spring term. Credit four hours. Prerequisite, at least one year of biological science or consent of the instructor. Two lectures and two laboratories per week. Lectures, W F 11:15. Laboratory, W F 2:30-4:25. Mr. Anderson.

Lectures on selected topics in the development, structure, function, and interrelations of invertebrate animals, with particular attention to phylogenetic aspects. Intensive laboratory work in representative invertebrates, utilizing living or fresh specimens wherever possible. A significant amount of independent work is required of each student, including reports on library research.

ANIMAL EMBRYOLOGY

(Biological Sciences 385.)

INSECT MORPHOLOGY AND HISTOLOGY

(Entomology 322, College of Agriculture)

VERTEBRATE MORPHOLOGY

(Veterinary Anatomy 900, Veterinary College)

410. GENERAL ANIMAL PHYSIOLOGY, LECTURES

Spring term. Credit three hours. Prerequisite, one year of biology; courses in chemistry, organic chemistry, physics, and biochemistry desirable. Lectures, M W F 10:10. Mr. Howland.

The principles of animal physiology are developed through consideration of the functioning of cells, tissues and organs. Specific topics discussed include respiration, metabolism, circulation, excretion, chemical integration, muscle contraction, nerve action and sensory reception.

410A. GENERAL ANIMAL PHYSIOLOGY, LABORATORY

Spring term. Credit one hour. Prerequisites, concurrent registration in Biological Sciences 410 or the equivalent. Lecture, W 2, alternate weeks only. Laboratory, T 8-11 or M T Th or F 1:25-4:25, alternate weeks. Mr. Howland.

Students are introduced to basic techniques utilized in the study of the physiology of animal tissues. Experiments cover topics dealing with respiration, properties of muscle, circulation, activity of nerves and osmotic phenomena.

[412. SPECIAL HISTOLOGY: THE BIOLOGY OF THE ORGANS]

Spring term. Credit four hours. Given in alternate years. Prerequisites, Biological Sciences 313, or consent of the instructor. Enrollment limited to 18 students. Lectures, W F 9:05. Stimson 105. Laboratory, W F 2-4:25. Mr. Wimsatt. Not offered in 1969-70.

FUNDAMENTALS OF ENDOCRINOLOGY

(Animal Science 427-428, College of Agriculture)

COMPARATIVE PHYSIOLOGY OF REPRODUCTION OF VERTEBRATES

(Poultry Science 425, College of Agriculture)

414. MAMMALIAN PHYSIOLOGY

Spring term. Credit six hours. Prerequisite, a year of biological sciences and consent of the instructor. Courses in biochemistry, histology, and gross anatomy desirable. Lectures, M W F 8. Discussion, S 10. Laboratory, M or W 1:25. Messrs. Visek (in charge), Gasteiger, Hansel, and Bensadoun.

A general course in mammalian physiology including circulation, respiration, digestion, metabolism, renal function, endocrinology, and the nervous system.

419. RESEARCH IN ANIMAL PHYSIOLOGY AND ANATOMY

Either term. Credit to be arranged. Undergraduates must attach to their pre-registration material written permission from the staff member who will supervise the work and assign the grade. Hours to be arranged. Staff.

Practice in planning, conducting, and reporting independent laboratory and/or library research programs.

SENSORY FUNCTION

(Biological Sciences 427, 427A)

513. EXPERIMENTAL ENDOCRINOLOGY

Fall term. Credit two or three hours. Prerequisites, a year of zoology or its equivalent, organic chemistry, physiology and consent of the instructor. Primarily for graduate students, open to undergraduates for two credits. Lectures, M F 11:15. Laboratory, M or F 2-4:25. Mr. Leonard.

Lectures on the anatomy and physiology of the vertebrate endocrine glands, glandular interrelationships, mechanisms of hormone action, chemical and physiological properties of the hormones, assay methods. Laboratory includes small animal surgery, micro technique for the endocrines, illustrative experiments on the effects of hormones.

[516. SPECIAL TOPICS IN COMPARATIVE PHYSIOLOGY]

Spring term. Credit to be arranged. Prerequisite, consent of the instructor. Enrollment limited. For advanced students in biological sciences. Hours to be arranged. Mr. McFarland. Not offered in 1969-70.

GENERAL PHOTOBIOLOGY

(Biological Sciences 547)

ELEMENTS OF PHYSICAL BIOLOGY

(Physical Biology 920, Veterinary College)

Fall term. Credit three hours. T Th F 11:15. Prerequisites, basic courses in chemistry, physics, biology, and calculus, or consent of the instructor. Mr. Comar and Staff.

Neurobiology and Behavior

320. NEUROBIOLOGY AND BEHAVIOR

Spring term. Credit three hours. Prerequisites, Biological Sciences 101-102 or 103-104. Limited to juniors, seniors, and graduate students. Lectures, T Th S 11:15. Messrs. Eisner (in charge), Gilbert, O'Brien, Halpern, Rosenblatt, Camhi, Howland, and Emlen, and Mrs. Salpeter.

Evolution of behavior, cueing of behavior, social and nonsocial behavior, neuroanatomy, neurophysiology, neurochemistry, neural networks, memory.

327. BEHAVIORAL MATURATION

(Also Psychology 327)

Fall term. Credit four hours. Prerequisites, familiarity with psychological theories of learning and development and one year of college biology. M W F 10:10. Mr. Lenneberg.

Emergence of behavior will be studied in the light of developmental biology, including behavior genetics, neuroembryology and morphogenesis, physical maturation of the brain, transformation and allometry as well as retarding influences from the environment.

421. COMPARATIVE VERTEBRATE ETHOLOGY

Fall term. Credit three hours. Prerequisites, Biological Sciences 101-102 or 103-104, and 320, and consent of the instructor. Lectures, T Th 9:05. Laboratory, to be arranged. Mr. Dilger.

A survey of the methods and principles of vertebrate ethology for students specializing in this field or for those in other branches of zoology wishing to broaden their knowledge of animal behavior. Emphasis is placed on the causation, function, biological significance, and evolution of species-typical behavior. The laboratories are designed to give first-hand knowledge of the material covered in lectures.

PHYSIOLOGICAL PSYCHOLOGY

(Psychology 323)

424. BRAIN AND BEHAVIOR

(Also Psychology 424)

Spring term. Credit four hours. Prerequisites, familiarity with theories of perception, memory, and physiological psychology or permission of the instructor. Hours to be arranged. Mr. Lenneberg.

A theoretical introduction to human neurology for psychologists. This survey of clinical symptoms and their etiology is designed to enable students to make use of disease for research purposes.

427. SENSORY FUNCTION

(Also Psychology 427)

Fall term. Credit three hours. Prerequisite, Biological Sciences 320 or the equivalent. Lectures, T Th 11:15. Discussion section to be arranged. Messrs. Halpern and Tapper.

Sensory receptors and the central nervous system transformation of afferent activity will be considered in relation to human and animal psychophysical data and to the adaptive significance of behavior. The receptors will be examined in terms of anatomy, biochemistry, biophysics of transduction, and the central nervous system control of peripheral input. Information and signal detection theories will be applied.

427A. LABORATORY IN SENSORY FUNCTION

(Also Psychology 427A)

Fall term. Credit two hours. Prerequisite, Biological Sciences 427 and permission of the instructors. Enrollment limited to fifteen students. Hours to be arranged. Messrs. Halpern and Tapper.

429. RESEARCH IN NEUROBIOLOGY AND BEHAVIOR

Either term. Credit to be arranged. Undergraduates must attach to their preregistration material, written permission from the staff member who will supervise the work and assign the grade. Hours to be arranged. Staff.

Practice in planning, conducting, and reporting independent laboratory and/or library research programs.

521-522. BRAIN MECHANISMS AND MODELS

Throughout the year. Credit four hours a term. Prerequisites, one year of calculus and one year of biological sciences or psychology and consent of the instructor. Lectures, M W 7:30-9 P.M. Laboratories to be arranged. Mr. Rosenblatt.

Fall term: Review of fundamentals of neurophysiology; psychological and physiological criteria for brain models; computers and digital automata in relation to brain mechanisms; review of representative models; theory of elementary perceptrons. Spring term: theory of multilayer and cross-coupled perceptrons; recognition of temporal patterns; problems of figure organization; cognitive sets, sequential programs, and other problems of advanced models; contemporary theories of memory.

523. ECOLOGICAL ASPECTS OF ANIMAL BEHAVIOR

Fall term. Credit three hours. Lectures, M W F 9:05. Messrs. Ambrose and Emlen.

A discussion of the interrelationships of animal behavior and ecology, with emphasis on the following topics: behavioral adaptations to the environment; ecological significance of diverse social systems; spatial relationships (habitat selection, homing, orientation, and navigation); role of social behavior in population regulation; evolution of altruistic behavior.

524. BEHAVIORAL NEUROPHYSIOLOGY

Spring term. Credit three hours. Prerequisite, Biological Sciences 320 or the equivalent. Lectures, T Th S 9:05. Mr. Camhi.

A study of the relationship between animal behavior and the activity of individual nerve cells, considered empirically. Review of electrical properties of excitable tissue. Predictions from the study of animal behavior. Sensory coding of environmental energies. Principles of integration. Integration of sensory inputs. Neural control of muscle contraction. Correlating nerve activity and behavior, problems and prospects. Examples will be chosen from throughout the animal kingdom, with slight preference for invertebrate phyla.

524A. BEHAVIORAL NEUROPHYSIOLOGY LABORATORY

Spring term. Credit two hours. Prerequisite, concurrent registration in Biological Sciences 524. Enrollment limited to fifteen students. Hours to be arranged. Mr. Camhi.

Experiments in neurophysiology, often related to specific behavior patterns.

FUNCTIONAL ORGANIZATIONS OF THE NERVOUS SYSTEM
(Physical Biology 924, Veterinary College)

620. SEMINAR IN NEUROBIOLOGY AND BEHAVIOR

Fall or spring term. Credit one hour. Organizational meeting first Monday of semester, 8 P.M. Hours to be arranged. Staff.

Fall topic: Animal Behavior; spring topic: Neurobiology.

622. SEMINAR IN ECOLOGICAL ANIMAL BEHAVIOR

Spring term. Credit one hour. Open to qualified graduate and undergraduate students who have taken courses in animal behavior and ecology, and who have secured consent of the instructor. Hours to be arranged. Mr. Ambrose.

Biochemistry

231. INTRODUCTORY BIOCHEMISTRY

Fall term. Credit three hours. Prerequisite, Chemistry 104 or 108, or the equivalent. May not be taken for credit by students who have completed a more advanced course in this section. Lectures, T Th F 12:20. Mr. Williams.

A brief survey of organic chemistry as related to biological compounds and a discussion of selected biochemical topics and reactions associated with the metabolism of animals, plants, and microorganisms. Especially designed as a general course for four-year students in Agriculture.

431. PRINCIPLES OF BIOCHEMISTRY, LECTURES

Fall term. Credit four hours. Prerequisite, Organic Chemistry 353-355 or the equivalent. Lectures, M 8; T Th S 8. Miss Daniel.

A basic course dealing with the chemistry of biological substances and their transformation in living organisms.

432. PRINCIPLES OF BIOCHEMISTRY, LABORATORY

Spring term. Credit three hours. Prerequisite, quantitative analysis or consent of the instructor; concurrent registration in Biological Sciences 431 or 532. Laboratory, M W or T Th 2-4:25. Discussion section, M 1:25. Preliminary examinations on March 5 and April 9, 1970 will be held at 7:30 P.M. Mr. Neal and Mrs. Fessenden.

Laboratory practice with biochemical substances and experiments designed to illustrate basic biochemical principles and techniques.

439. RESEARCH IN BIOCHEMISTRY

Either term. Credit to be arranged. For undergraduate students concentrating in biochemistry. Prerequisite, adequate ability and training for the work proposed. Undergraduates must attach to their preregistration material, written permission from the staff member who will supervise the work and assign the grade. Hours to be arranged. Staff.

Special work in any branch of biochemistry on problems under investigation by the staff of the section.

530. BIOCHEMISTRY OF THE VITAMINS

Spring term. Credit two hours. Given in alternate years. Prerequisites, Chemistry 353-355 and Biological Sciences 431 or their equivalent. Lecture, T Th 10:10. Miss Daniel.

The chemical and biochemical aspects of the vitamins.

531-532. GENERAL BIOCHEMISTRY, LECTURES

Throughout the year. Credit four hours a term. Prerequisite, Chemistry 358 and physical chemistry. Lectures, M W F S 9:05. Fall term: Mr. Calvo and staff; Spring term: Mr. Guillory and staff.

An integrated treatment of the fundamentals of biochemistry. Fall term: Proteins, enzymes and the nature of enzymatic catalysis; carbohydrate metabolism; nitrogen metabolism. Spring term: Energetics; lipid metabolism; biosynthesis of macromolecules.

533. GENERAL BIOCHEMISTRY, LABORATORY

Fall term. Credit three hours. Prerequisites, Chemistry 358 and 388 or 390; Biological Sciences 531 or concurrent registration. Laboratory, T or Th 9:05-4:25. One discussion section to be arranged. First meeting for both sections

will be held on the first Tuesday at 9:05. Messrs. Nelson, McCarty and Wharton.

Selected experiments on carbohydrates, proteins, amino acids, and metabolism (cellular particulates, kinetics, general enzymology) will be given to illustrate basic biochemical principles. The course will emphasize the quantitative aspects rather than qualitative identifications.

536A. ADVANCED BIOCHEMICAL METHODS, LABORATORY

Spring term. Credit two hours. Prerequisite, Biological Sciences 533. Graduate majors in biochemistry only. Hours to be arranged. Miss Keller and Mr. Wu.

Research techniques in biochemistry and molecular biology.

536B. ADVANCED BIOCHEMICAL RESEARCH

Spring term. Credit two hours. Prerequisite, Biological Sciences 536A. Graduate majors in biochemistry only. Hours to be arranged. Mr. Racker and staff.

Research work in the laboratory of staff members on a rotating basis.

537-538. ADVANCED BIOCHEMISTRY, LECTURES

Throughout the year. Credit one to three hours a term. Prerequisites, 531 and 532 or consent of the instructor. May be repeated for credit. Students may take one or more sections of the course, as each section can be taken without attending a preceding section. T Th 9:05. Staff.

This course will be comprised of advanced lectures in three of the following subjects per term (different subjects will be selected for different years): carbohydrates and lipids, proteins and enzymes, biochemistry of membranes, mechanism of coenzyme function, mechanism of enzyme action, nucleic acids, protein synthesis, control mechanisms, bioenergetics, etc.

631-632. RESEARCH SEMINAR IN BIOCHEMISTRY

Throughout the year. Credit one hour a term. M 8-9:30 P.M. Mr. Racker. Required of all graduate students (except first-year students) majoring in biochemistry. May be repeated for credit.

634. GRADUATE SEMINAR IN BIOCHEMISTRY

Spring term. Credit one hour. Prerequisites, 531 and 532. Hours to be arranged. Staff.

Original publications in the areas of 537-538 will be assigned to students for reporting and discussion.

639. BIOCHEMISTRY SEMINAR

Either term. No credit. F 4:15. Savage 100. Staff.

Lectures on current research in biochemistry presented by distinguished visitors and staff.

Botany

240. PLANT PHYSIOLOGY

Spring term. Credit five hours. Primarily for undergraduates; open to graduate students without background in plant physiology. Prerequisites, Biological Sciences 101-102 or 103-104, and introductory chemistry. Prior or a simultaneous course in organic chemistry is desirable. Lectures, T Th S 10:10. Conference 12:20-1:10 on same day as laboratory. Laboratory, M T W Th or F 1:25-4:25. Messrs. Jagendorf, Spanswick and assistants.

The behavior, growth, and environmental responses of plants, primarily, but

not exclusively, higher plants. Topics will include membrane properties, solute and water transport, the uses of osmotic forces; mineral nutrition; organic nutrition, growth characteristics, hormone action; light, gravitational and temperature responses; diurnal rhythms, photoperiod; saline, drought and freezing injury; respiration and photosynthesis.

344. BIOLOGY OF THE ALGAE

Spring term. Credit four hours. Lectures, M W F 11:15. Laboratory, M or F 2-4:25. Mr. Kingsbury.

An introduction to the freshwater and marine algae including consideration of their ecology as members of the plankton and benthos and their importance to man. The laboratory, utilizing field material and cultures from an extensive living collection, is designed to illustrate lecture topics, provide familiarity with algae in the field, and introduce the student to techniques used in isolating, culturing, and studying algae in the laboratory.

COMPARATIVE MORPHOLOGY OF FUNGI

(Plant Pathology 309, College of Agriculture)

345. PLANT ANATOMY

Fall term. Credit four hours. Lectures, T Th 8. Laboratory, T Th 10:10-12:35 or M W 2-4:25. Staff.

A detailed study of plant histology with equal emphasis on developmental aspects and mature structure.

347. CYTOLOGY

Fall term. Credit four hours. Prerequisite, Biological Sciences 101-102 or 103-104 or the equivalent. Lectures, M W 9:05. Laboratory, M W or T Th 10:10-12:35. Mr. Uhl.

A study primarily of the structure of cells and their components and the relation of these to function and to heredity. Special attention is given to chromosomes. Both plant and animal material are used.

349. PLANTS AND MAN

Fall term. Credit three hours. Lectures and discussion, M W F 9:05. Mr. Bates.

A consideration of the role of plants in the human environment and in the evolution of civilizations. Intended for students in all colleges. Emphasis is on ethnobotanical considerations and on historical to present-day utilization of plants in nutrition, housing, clothing, medicine, religion, and the arts.

340. CYTOGENETICS

Spring term. Credit three hours. Prerequisites, Biological Sciences 347 and 281 or the equivalent. Lectures, M W 9:05. Laboratory, M or W 10:10-12:35. Mr. Uhl.

An advanced course dealing mainly with the cellular mechanisms of heredity and including recent researches in cytology, cytogenetics, and cytotoxicology.

[444. MORPHOLOGY OF LOWER VASCULAR PLANTS]

Spring term. Credit four hours. Given in alternate years. Prerequisite, Biological Sciences 345 and consent of the instructor. Lectures, M W 12:20. Laboratory, M W 2-4:25. Not offered in 1969-70.

[446. MORPHOLOGY OF HIGHER VASCULAR PLANTS]

Spring term. Credit four hours. Given in alternate years. Prerequisites, Bio-

logical Sciences 345 and consent of the instructor. Lectures, M W 12:20. Laboratory, M W 2-4:25. Not offered in 1969-70.

449. RESEARCH IN BOTANY

Either term. Credit to be arranged. Undergraduates must attach to their pre-registration material, written permission from the staff member who will supervise the work and assign the grade. Hours to be arranged. Staff.

Students engaged in special problems or making special studies may register in this course. They must satisfy the instructor under whom the work is taken that their preparation warrants their choice of problem.

543. PLANT PHYSIOLOGY, ADVANCED LABORATORY TECHNIQUES

Fall term. Credit four hours. Primarily for graduate students doing work in plant physiology, but open to others if space permits. Prerequisites, organic chemistry, Biological Sciences 240, or the equivalent, and biochemistry. Laboratory, T or W 8-5. Recitation, M 4:30-5:30. Staff.

An introduction to some modern methods in experimental plant biology.

[545. PHYSICAL APPROACHES TO PROBLEMS OF PHOTOSYNTHESIS]

Fall term. Credit three hours. Given in alternate years. Prerequisites, Chemistry 104 or 108, Mathematics 112, Physics 208, or consent of the instructor. Lectures, M 1:25, T Th 10:10. Mr. Clayton. Not offered in 1969-70.

547. GENERAL PHOTOBIOLOGY

Fall term. Credit three hours. Given in alternate years. Prerequisites, same as for Biological Sciences 545. Lectures, M 1:25, T Th 10:10. Mr. Clayton.

A survey of systems of current interest in photobiology, including photosynthesis, bioluminescence, vision, photoperiodism, and the action of ultraviolet on nucleic acids. Physical concepts and methodologies are emphasized.

548. PLANT PHYSIOLOGY: ASPECTS OF METABOLISM

Spring term. Credit three hours. Given in alternate years. Prerequisites, Biological Sciences 240 and 431, Chemistry 353, or the equivalent. Lectures, M W F 9:05. Messrs. Jagendorf, Thompson, McCarty and staff.

Selected areas of plant biochemistry will be reviewed in the context of the plant life cycle and responses to the environment. Probable topics include: metabolism and storage function of lipids, carbohydrates, organic acids, proteins and pigments; nitrogen and sulfur assimilation; hormone metabolism; respiration, photosynthesis, development and replication of mitochondria and chloroplasts; cell wall composition and properties. Attention will be paid to operation of control mechanisms.

[549. PLANT PHYSIOLOGY: TRANSPORT PHENOMENA]

Fall term. Credit three hours. Given in alternate years. Prerequisites, Biological Sciences 240 or its equivalent. Lectures, M W Th 11:15. Mr. Spanswick. Not offered in 1969-70.

587. PERSPECTIVES IN PLANT PHYSIOLOGY: ADVANCED LECTURE SERIES

Fall term. Credit two hours. M W F 10:10. Mr. Steward.

Primarily intended for graduate students, but open to qualified undergraduates, the course will review salient topics in plant physiology, their present status, historical development and the problems they still present. Topics considered will change somewhat from year to year but will normally include some treatment of cell physiology, organic and inorganic nutrition, metabolism, growth and development.

PLANT ECOLOGY

(Biological Sciences 563)

ADVANCED MYCOLOGY

(Plant Pathology 569, 579, 589, College of Agriculture)

643. SEMINAR IN PLANT PHYSIOLOGY

Either term. Credit one hour. Required of graduate students taking work in plant physiology and open to all who are interested. F 11:15. Staff.

Reports on current research in plant physiology, by visitors, staff, or advanced graduate students.

645. CURRENT TOPICS IN PLANT PHYSIOLOGY

Either term. Credit two hours. May be repeated for credit. Hours to be arranged. Staff.

Seminar reports by graduate students on current literature in experimental plant physiology or related areas.

647. SPECIAL TOPICS IN PLANT TAXONOMY

Either term. Credit one hour a term. Prerequisite, consent of the instructor. Lecture and discussion. Hours to be arranged. Messrs. Moore, Dress, Ingram, and Bates.

A series of four topics, one presented each term, designed to provide professional background in biosystematics, literature of taxonomic botany, nomenclature, and tropical families of phanerogams.

A. *Families of Tropical Phanerogams*. Fall term, 1969. The families of flowering plants encountered solely or chiefly in tropical regions will be considered in lectures, discussions and demonstrations with the aim of providing basic points of recognition for and an understanding of diversity and relationships in these families for the student venturing into the tropics. Mr. Moore.

B. *Literature of Taxonomic Botany*. Spring term 1970. A survey of the basic reference works in taxonomy from the pre-Linnaean literature drawn on by Linnaeus to contemporary publications with comments on the peculiarities of the books (when appropriate), on publication dates, typographic devices and intricacies of bibliographic citation. Lectures, demonstrations, discussions, and problems. Mr. Ingram.

C. *Nomenclature*. Fall term 1970. An analysis of the International Code of Botanical Nomenclature and its application to various plant groups. Lectures, problems, discussion. Mr. Dress.

D. *Biosystematics*. Spring term 1971. A consideration of biosystematic approaches to taxonomy, including chemical, numerical, cytological and statistical methodologies as well as a review of classic studies. Mr. Bates.

CURRENT TOPICS IN MYCOLOGY

(Plant Pathology 649, College of Agriculture)

Ecology, Evolution, and Systematics

270. BIOLOGY OF THE VERTEBRATES

Spring term. Credit four hours. Prerequisite, Biological Sciences 101-102 or 103-104. Lectures, M W 10:10. Laboratory, M W or T Th 2-5 or T Th 8-11. Mr. Cade.

An introduction to the evolution, classification, life history, ecology, and behavior of vertebrate animals. Laboratory and field work is concerned with structure, classification, taxonomic methods, biology of local species, and studies of selected aspects of vertebrate life, including food habits, activity cycles, behavior, and physiological adaptation.

INSECT BIOLOGY

(Entomology 212, College of Agriculture)

INVERTEBRATE ZOOLOGY

(Biological Sciences 316)

PLANT TAXONOMY

(Biological Sciences 341, 442, 641)

361. GENERAL ECOLOGY

Either term. Credit three hours. Not open to freshmen. Prerequisites, Biological Sciences 101-102 or 103-104 or the equivalent. Lectures, T Th 9:05. Discussion, W or Th 1:25, 2:30 or 3:35. Fall term, Mr. Feeny; spring term, Mr. Root.

Principles concerning the interactions between organisms and their environment. Influence of competition, social behavior, predation, and other factors on population size and dispersion. Role of energy flow and mineral cycling in determining the structure and productivity of ecosystems. Succession and classification of natural communities. Influence of climate and past events on the diversity and stability of communities in different regions of the world. Interspecific competition and the niche concept. Chemical interactions between organisms. Application of ecological principles to human problems. Modern evolutionary theory will be stressed throughout and attention given to conflicting ecological hypotheses.

362. LABORATORY AND FIELD ECOLOGY

Fall term. Credit two hours. Prerequisite, consent of the instructor. Laboratory, T Th 2-4:25. Mr. Cole and others.

A laboratory and field course, to accompany or follow Biological Sciences 361, for students who intend to concentrate in the area of ecology. Enrollment limited. This course will give the students a first-hand contact with ecological techniques.

SOIL MICROBIOLOGY

(Agronomy 306, College of Agriculture)

INTRODUCTORY INSECT TAXONOMY

(Entomology 331, College of Agriculture)

INTRODUCTORY PARASITOLOGY

(Entomology 351, College of Agriculture)

BIOLOGY OF THE ALGAE

(Biological Sciences 344)

364. FIELD MARINE BIOLOGY

Credit two hours. Prerequisite, a full year of college biology. A special course offered on Star Island, off Portsmouth, New Hampshire, June, 1970. Messrs. Anderson, Gilbert, Hewitt, Rancy, Barlow, Kingsbury (in charge), and guest lecturers.

Living material and habitats are emphasized in introducing students to the major disciplines of marine biology and in rounding out the student's knowledge of these topics as presented at inland locations. For more details, see the *Announcement of the Summer Session*, or consult Mr. Kingsbury.

371. EVOLUTION AND TAXONOMY OF VASCULAR PLANTS

Fall term. Credit four hours. Prerequisite, Biological Sciences 281 or consent of the instructor. Lectures and discussions, T Th 9:05. Laboratory, T Th 2-4:25. Mr. Clausen.

An introduction to the evolution and classification of vascular plants, with attention to principles, methods of identification, and literature. In the first part of the term trips are held in laboratory periods.

460. MARINE ECOLOGY

Spring term. Credit three hours. Prerequisites, Biological Sciences 361, 461, and consent of the instructor. Enrollment limited. Lectures, M W F 10:10. Mr. Barlow.

A consideration of the oceanographic aspects of the marine environment. For graduate students and advanced undergraduates. Lectures and seminars, with demonstrations and field trips to be arranged.

461. OCEANOGRAPHY

Fall term. Credit three hours. Prerequisites, college physics and chemistry; college mathematics desirable. Lectures, T Th 10:10. Additional lectures Th 12:20 alternating with laboratory M, T or Th 2-4:30. Mr. Barlow.

An introduction to general oceanography, designed to present a general description of the physical aspects of the oceans as a background for further studies in marine science. Laboratory, which will meet for about half the term, will be devoted to field demonstrations of equipment, analysis of some typical oceanographic observations, and work with simple models.

462. LIMNOLOGY

Spring term. Credit four hours. Prerequisites, Biological Sciences 361, organic chemistry, and one year of college physics or consent of the instructor. Lecture, W F 11:15. Laboratory, F 1:25-4:25, S 9-12. Mr. Likens.

A study of processes and mechanisms in the biology, chemistry and physics of inland waters taught from a functional and analytic point of view. Laboratories devoted to both field studies and experiments on model systems.

462A. LIMNOLOGY, LECTURES

Spring term. Credit three hours. Prerequisites, Biological Sciences 361, organic chemistry, and one year of college physics, or consent of the instructor. Lecture, M W F 11:15. Mr. Likens.

The lecture portion of Biological Sciences 462.

463. PLANT ECOLOGY

Fall term. Credit four hours. Prerequisite, Biological Sciences 101-102 or 103-104 or the equivalent. Lectures, M W F 10:10. Laboratory and field trips, T or F 2-5. Messrs. Miller and Whittaker.

Principles of plant-environment interactions in relation to the distribution, structure and functioning of plant communities. These principles will be illustrated by analyzing in the field representative plant communities and their environments in various parts of the world.

[464. EVOLUTION AND ECOLOGY OF VASCULAR PLANTS]

Spring term. Credit four hours. Prerequisite, Biological Sciences 341 or consent of the instructor. Lectures and discussions, T Th 9:05. Plant Science 143. Laboratory, T Th 2-4:25. Mr. Clausen. Not offered in 1969-70.

AQUATIC ENTOMOLOGY AND LIMNOLOGY

(Entomology 471, College of Agriculture)

469. BIOLOGY OF FISHES

Fall term. Credit four hours. Prerequisite, Biological Sciences 101-102 or 103-104, or 270, or the equivalent. Lectures, M W 9:05. Laboratory, M W or T Th 2-4:25. Mr. Raney.

An introduction to the study of fishes; their structure, classification, evolution, distribution, ecology, physiology, and behavior. Laboratory studies on structure, identification, classification, and nomenclature. Field studies of local species.

[470. ICHTHYOLOGY]

Fall term. Given in even numbered years. Credit four hours. Prerequisite, Biological Sciences 469 or consent of the instructor. Lectures, M W 9:05. Fernow 16. Laboratory M W 2-4:30. Mr. Raney. Not offered in 1969-70.

471. MAMMALOLOGY

Fall term. Credit four hours. Prerequisites, Biological Sciences 270 or equivalent work in vertebrate biology and consent of the instructor. Lectures, T Th 10:10. Laboratory, F 2-4:25, and S 9:05-11:30. Mr. Hudson.

Lectures on the evolution, classification, distribution and adaptations, both physiological and morphological, of mammals. Laboratory and field work on ecology, behavior, physiology and the taxonomy of recent mammals, with emphasis on the North American fauna.

472. ORNITHOLOGY

Spring term. Credit four hours. Prerequisites, Biological Sciences 270 or equivalent work in vertebrate biology and consent of the instructor. Lectures, M W 11:15. Laboratory, W 2-4:30 and S 8-11. Mr. Lancaster.

Lectures cover various aspects of the biology of birds, including anatomy, physiology, classification, evolution, migration and orientation, behavior, ecology and distribution. Laboratory will include studies of external and internal morphology, pterylosis, molts and plumages, skin identification of birds of New York and families of birds of the world. Several demonstration periods will emphasize hybridization, evolution, adaptive radiation, mimicry, and geographic variation. Field work includes identification of birds and familiarization of some techniques used in field research.

475. EVOLUTIONARY THEORY

Fall term. Credit four hours. Prerequisites, Biological Sciences 281; a course with some taxonomic content in botany or zoology is desirable, or else some experience with making and maintaining a personal collection of some plant or animal group. Lectures, T Th 11:15. Discussion, Th 12:20. Mr. Brown.

Lectures and class discussions on organic evolution, with primary emphasis on the mechanisms of speciation and adaptation. The course begins with a few lectures on taxonomic methodology.

479. RESEARCH IN ECOLOGY, EVOLUTION, AND SYSTEMATICS

Either term. Credit to be arranged. Undergraduates must attach to their pre-

registration material, written permission from the staff member who will supervise the work and assign the grade. Hours to be arranged. Staff.

Practice in planning, conducting, and reporting independent laboratory and/or library research programs.

ECOLOGICAL ASPECTS OF ANIMAL BEHAVIOR
(Biological Sciences 523)

561-562. QUANTITATIVE ECOLOGY

Throughout the year. Credit four hours a term. Given in alternate years. Prerequisites, one year of biology and consent of the instructor. Organic chemistry and some college mathematics are desirable. Lectures, M W 11:15. Laboratory, W 1:25-4:25. Mr. Cole.

A quantitative course on selected ecological topics for the advanced undergraduate and graduate students. Topics include the origin and interpretation of habitat differences, toleration and response physiology, population dynamics, construction and uses of life tables, spatial distribution patterns, and approaches to the quantitative analysis of biotic communities.

563. ADVANCED PLANT ECOLOGY

Spring term. Credit four hours. Prerequisite, Biological Sciences 463. One course each in plant physiology and soils is strongly recommended. Lectures, M W F 10:10. Mr. Miller.

Lectures and seminars dealing with the physiological mechanisms and the physical, chemical, and biological processes which underlie ecosystem structure and function. Some major topics included will be responses to the environment by individual plants, populations and species, and the flux of energy, nutrients and water in ecosystems.

565. SPECIAL TOPICS IN LIMNOLOGY

Fall term. Credit three hours. Primarily for graduate students. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Likens.

A laboratory and seminar course. Advanced discussion and experimentation in specific topics in limnology. Content variable from year to year, but in general dealing with topics related to the production and metabolism of biological associations in inland water.

ADVANCED INSECT TAXONOMY
(Entomology 531, 532, 533, 534, College of Agriculture)

ADVANCED PARASITOLOGY: PROTOZOA AND HELMINTHS
(Entomology 551, College of Agriculture)

571. ADVANCED TOPICS IN VERTEBRATE BIOLOGY

Fall term. Credit two hours. Prerequisites: Advanced courses in vertebrate biology and consent of the instructors. Enrollment limited. Messrs. Cade and Hudson.

Seminars on selected topics of vertebrate ecology, behavior, physiology, and systematics with an emphasis on review of current literature. Time and place to be arranged.

661. SEMINAR IN POPULATION AND COMMUNITY ECOLOGY

Fall term. Credit one hour. Restricted to graduate students. Prerequisites, a course in ecology and consent of the instructor. Lecture, M 7:30 P.M. Mr. Root.

The topic for 1969 will be the organization and natural communities. Participants will present reports on the evidence for recent theories advanced to explain the structure of food webs, the relative abundance of species, and the regulation of species diversity in communities. This course may be repeated for credit.

662. POPULATION ECOLOGY

Spring term. Credit three hours. Prerequisite, one course in ecology and physiology and consent of the instructor. Lectures, M W F 11:15. Messrs. Cole and Hall.

Critical examination of the properties and dynamics of populations. Emphasis on population theory, experimental approaches and analysis of natural populations.

663. SEMINAR IN EVOLUTION AND ECOLOGY OF VASCULAR PLANTS

Fall term. Credit one hour. Prerequisite, Biological Sciences 464 and Statistics 510 or 511 or the equivalent, or consent of the instructor. Lecture and discussion, M 11:15. Mr. Clausen.

A consideration of primary problems concerned with the classification, evolution, and environmental relationships of vascular plants.

665. ENVIRONMENTAL PHYSIOLOGY

Fall term. Credit three hours. Prerequisite, one course in ecology and physiology and consent of the instructor. Lectures, M W F 11:15. Messrs. McFarland and Miller.

Consideration of the responses of organisms to environmental variables. Emphasis on similarities and differences in molecular and organismal mechanisms by which plants and animals cope with their environments.

Genetics and Development

280. HUMAN GENETICS

Spring term. Credit three hours. Prerequisite, Biological Sciences 101-102 or 103-104. Students who have had Biological Sciences 281 may register only with the consent of the instructor. Lectures, M W 10:10. Discussion, F 10:10. Mr. Srb.

An introduction to biological heredity through consideration of the genetics of man. Advances in the science of genetics are having a profound effect on man's understanding of himself and on his potential for influencing his present and future well-being. The course is intended primarily to contribute to the student's general education in these matters, and although certain aspects of genetics will be considered with some rigor, the course is not designed to serve as a prerequisite to advanced courses in genetics.

281. GENETICS

Either term. Credit four hours. Prerequisite, Biological Sciences 101-102 or 103-104. Students who have had Biological Sciences 280 may register only with the consent of the instructor. Lectures, M W F 8. Laboratory, M T W Th or F 2:30-4:25, or T Th S 8-9:55. Students do not preregister for laboratory sections; laboratory assignments will be made at the end of the first lecture period. Messrs. Fink, MacIntyre, Stinson and assistants.

A general study of the fundamental principles of genetics in eucaryotes, procaryotes, and viruses. Discussions of gene transmission, gene action and

interaction, gene linkage and recombination, gene structure, gene and chromosome mutations, genetic aspects of differentiation, genes in populations, breeding systems, extrachromosomal inheritance. Animals, plants and microorganisms are used in the laboratory, which also includes an independent study of inheritance in *Drosophila*.

CYTOLOGY

(Biological Sciences 347)

385. ANIMAL EMBRYOLOGY

Fall term. Credit four hours. Prerequisite, Biological Sciences 281. Lectures, M W F 9:05. Laboratory, W 10:10-12:35 or 2-4:25 or F 10:10-12:35 or 2-4:25. Mr. Blackler.

An introductory course in general animal embryology with major emphasis directed to vertebrates. The lectures cover the physiological, genetical and morphological bases of early development. The laboratories have a strong anatomical theme.

CYTOGENETICS

(Biological Sciences 440)

480. POPULATION GENETICS

Spring term. Credit three hours. Prerequisite, Biological Sciences 281 or the equivalent and consent of the instructor. Lectures, T Th 11:15. Mr. Wallace.

A study of factors which influence the genetic structure of Mendelian populations and which are involved in race formation and speciation.

482. PHYSIOLOGICAL GENETICS

Spring term. Credit three hours. Prerequisites, Biological Sciences 281 and a course in organic chemistry. Lectures, M W 8. Mr. Srb.

The nature and activities of chromosomal and nonchromosomal genetic material are considered in relation to the functional attributes of organisms.

489. RESEARCH IN GENETICS AND DEVELOPMENT

Either term. Credit to be arranged. Undergraduates must attach to their preregistration material, written permission from the staff member who will supervise the work and assign the grade. Hours to be arranged. Staff.

Practice in planning, conducting, and reporting independent laboratory and/or library research programs.

584. EXPERIMENTAL EMBRYOLOGY, LECTURES

Spring term. Credit two hours. Prerequisite, Biological Sciences 281. Lectures, T Th 11:15. Mr. Blackler.

An advanced course in animal development in which the main emphasis is placed on developmental physiology and developmental genetics.

586. EXPERIMENTAL EMBRYOLOGY, LABORATORY

Spring term. Credit three hours. Prerequisites, Biological Sciences 385 and consent of the instructor. T Th 1:25-4:25. Enrollment strictly limited. Mr. Blackler.

Students in this course will be able to work almost entirely with living material and will be able to carry out some classical and modern experiments.

680. CURRENT TOPICS IN GENETICS

Either term. Credit two hours. Open to graduate students, with preference

given to majors in the field of genetics; undergraduates by permission only. No auditors. Enrollment limited to twenty students. Hours to be arranged. Staff.

A seminar course with critical presentation and discussion by students of original research papers in a particular area of current interest. Content of the course and staff direction will vary from term to term, and will be announced a semester in advance.

Microbiology

290. GENERAL MICROBIOLOGY

Either term. Credit five hours. Prerequisites, Biological Sciences 101-102 or 103-104 and Chemistry 104 or 108 or the equivalent. Lectures, M W F 11:15. Laboratory, M W 2-4:25; T Th 8-11 or 2-4:25. Fall term, Mr. Seeley; spring term, Mr. VanDemark.

A study of the basic principles and relationships in the field of microbiology, with fundamentals necessary to further work in the subject. The course offering in the spring term will provide special emphasis on the application of microbiology in home economics and agriculture.

290A. GENERAL MICROBIOLOGY, LECTURES

Either term. Credit three hours. Prerequisites, Biological Sciences 101-102 or 103-104 and Chemistry 104 or 108 or the equivalent. Lectures, M W F 11:15. Fall term, Mr. Seeley; spring term, Mr. VanDemark.

The same as the lecture part of Course 290. Will not serve alone as a prerequisite for advanced microbiology courses.

290B. GENERAL MICROBIOLOGY, LABORATORY

Either term. Credit two hours. May be taken only by special consent of the instructor. Fall term, Mr. Seeley; spring term, Mr. VanDemark.

The same as the laboratory part of Biological Sciences 290.

390A. ADVANCED BACTERIOLOGY, LECTURES

Fall term. Credit three hours. Prerequisites, organic chemistry, Biological Sciences 290 or consent of the instructor, and biochemistry. Biochemistry may be taken concurrently. Lectures, T Th S 9:05. Mr. MacDonald.

A study of the comparative physiological and ecological relationships among bacteria and some related organisms. A number of groups of bacteria will be discussed in detail as well as factors which influence their ability to survive in nature. In addition, a number of lectures will be devoted to the history of bacteriology and to the theory and development of bacterial classification.

390B. ADVANCED BACTERIOLOGY, LABORATORY

Fall term. Credit three hours. Prerequisites, concurrent registration in 390A and consent of the instructor. Limited enrollment. Preference given to those students planning to register for Biological Sciences 490B. Laboratory-lecture, M 1:25; discussion, F 9:05. Mr. MacDonald.

Techniques for the isolation, cultivation, and detailed study of selected groups of organisms. Some of the more standard techniques of physiological study will be introduced.

393. APPLIED AND INDUSTRIAL MICROBIOLOGY

Fall term. Credit three hours. Given in alternate years. Prerequisites, Biologi-

cal Sciences 290 or the equivalent. Lectures, T Th S 11:15. Messrs. Delwiche, Seeley, VanDemark.

A survey of the microbiology of industrial fermentations, water, and waste decomposition.

394. DAIRY AND FOOD MICROBIOLOGY

Spring term. Credit four hours. Prerequisite, Biological Sciences 290. Lectures, M W 12:20. Laboratory, M W 2-4:25. Mr. Naylor.

The major families of microorganisms of importance in dairy and food science are studied systematically with emphasis on the role played by these organisms in food preservation, food fermentations, and public health. The laboratory work includes practice in the use of general and special methods for microbiological testing and control of dairy and food products as well as practice in the isolation and characterization of organisms found in foods.

SOIL MICROBIOLOGY

(Agronomy 306, College of Agriculture)

PATHOGENIC BACTERIOLOGY

(Microbiology 340, Veterinary College)

490A. MICROBIAL PHYSIOLOGY LECTURE

Spring term. Credit three hours. Prerequisites, Biological Sciences 390 or consent of the instructor. Lectures, T Th S 10:10. Primarily for microbiology majors intending to enter graduate school and for graduate students. Mrs. Gibson and staff.

A study of the organization of physiological processes in microorganisms, including a study of structure, energy-yielding mechanisms, macromolecular biosynthesis and of growth and regulation.

490B. MICROBIAL PHYSIOLOGY LABORATORY

Spring term. Credit three hours. Prerequisites, a grade of B- or better in Biological Sciences 390, concurrent registration in 490A and consent of the instructor. Hours to be arranged. Mrs. Gibson and staff.

Experiments on material covered in Course 490A will be used to introduce students to modern techniques used in physiological research, such as the use of radioisotopes, large-scale growth of microorganisms, and the isolation and characterization of specific cellular components.

495A. MICROBIAL GENETICS, LECTURES

Fall term. Credit two hours. Prerequisites, Biological Sciences 281 and 290, or consent of the instructor. For upperclassmen and graduate students. Lecture, W 7:30-9:25 P.M. Mr. Zahler.

Genetics of bacteria and their viruses, with emphasis on the mechanisms of genetic phenomena.

495B. MICROBIAL GENETICS, LABORATORY

Fall term. Credit three hours. Prerequisite, Biological Sciences 495A, or concurrent registration, and consent of the instructor. Laboratory, T 1:25-4:25, and other hours to be arranged. Mr. Zahler.

Laboratory methods in the genetics of bacteria and their viruses.

496. CHEMISTRY OF MICROBIAL PROCESSES

Spring term. Credit two hours. Prerequisites, beginning courses in general microbiology, biochemistry, and organic chemistry. Course intended for upperclassmen and graduate students. Lectures, M W 11:15. Mr. Delwiche.

Selected topics pertaining to the energy metabolism, oxidative and fermentative abilities, and biosynthetic capacities of microorganisms. Where possible and appropriate, the subject matter deals with the various microbial forms in a comparative sense.

498. VIROLOGY

Spring term. Credit three hours. Given in alternate years. Prerequisites, Biological Sciences 290 and 281 and consent of the instructor. Lectures, T Th S 11:15. Mr. Naylor, assisted by Messrs. Ross and Carmichael.

A study of the basic physical, chemical, and biological properties of plant, animal and bacterial viruses.

499. RESEARCH IN MICROBIOLOGY

Either term. Credit to be arranged. Undergraduates must attach to their preregistration material, written permission from the staff member who will supervise the work and assign the grade. Hours to be arranged. Staff.

590. METHODS IN ADVANCED BACTERIOLOGY

Either term. Credit two hours. Primarily for graduate students. Prerequisite, consent of the instructor. Limited enrollment. Hours to be arranged. Staff.

Intended to acquaint advanced students with some of the more important techniques used in the study of bacterial physiology. Emphasis will be placed on the use of radioisotopes; growth, structure and function of cells.

596. MOLECULAR IMMUNOLOGY

Spring term. Credit two hours. For advanced undergraduates and graduate students. Prerequisite, Biological Sciences 531 or consent of the instructor. Hours to be arranged. Mr. Slobin.

A study of the immune response with particular emphasis on the structure and evolution of immunoglobulins, the nature of antigen-antibody interactions and the molecular biology of antibody biosynthesis.

ADVANCED SOIL MICROBIOLOGY
(Agronomy 506, College of Agriculture)

SEROLOGY
(Microbiology 941, Veterinary College)

IMMUNOCHEMISTRY
(Microbiology 944, Veterinary College)

ANIMAL VIROLOGY
(Microbiology 945, Veterinary College)

691. GRADUATE SEMINAR IN MICROBIOLOGY

Either term. Credit one hour. Required of all graduate students majoring in microbiology. Hours to be arranged. Staff.

699. MICROBIOLOGY SEMINAR

Either term. No credit. Th 4:15. Required of graduate students majoring in microbiology and open to all who are interested. Staff.

CHEMISTRY

Mr. R. A. Plane, Chairman; Messrs. A. C. Albrecht, S. H. Bauer, A. T. Blomquist, J. M. Burlitch, R. A. Caldwell, W. D. Cooke, V. du Vigneaud, E. L. Elson, R. C. Fay, M. E. Fisher, G. A. Fisk, J. H. Freed, M. J. Goldstein, G. G. Hammes, J. L. Hoard, R. Hoffmann, R. E. Hughes, E. S. Kostiner, F. A. Long, F. W. McLafferty, J. Meinwald, W. T. Miller, G. H. Morrison, H. Muxfeldt, R. F. Porter, R. R. Rye, H. A. Scheraga, M. F. Semmelhack, M. J. Sienko, D. A. Usher, B. Widom, C. F. Wilcox.

CHEMISTRY MAJOR. A major in chemistry permits considerable flexibility in the detailed planning of a course program. The required courses can be completed in three years, leaving the senior year open for advanced and independent work in all areas of chemistry: physical, organic, inorganic, analytical, theoretical, bio-organic, biophysical. A major in chemistry can also provide the necessary basis for significant work in related areas such as molecular biology, chemical physics, geochemistry, chemical engineering, solid state physics, and medicine.

The courses are arranged as a progression with some courses (including mathematics and physics) prerequisite to those which are more advanced. During the first year the student should normally register for general chemistry (preferably Chemistry 115-116), mathematics, a Freshman Humanities course, a foreign language if necessary or, in some instances, physics. Students who are not prepared to begin their programs with Chemistry 115-116 may choose as alternatives Chemistry 107-108 or Chemistry 103-104 and 108 or, by petition, 103-108 for general chemistry. In the second year the student should complete calculus, take physics, organic chemistry, and complete a course in Distribution (see p. 20). Physical Chemistry I and II and the analytical and physical laboratory courses (339 and 392) should be completed in the third year along with courses in Distribution if necessary. Advanced work in chemistry and related subjects could be pursued in the fourth year and, to some extent, in the earlier years as well. The opportunity for independent research is also available. All students with questions about details of a major program are encouraged to consult with the chairman of the Department of Chemistry or his representative. Entering students exceptionally well prepared in chemistry may receive advanced placement credit for Chemistry 107-108 and proceed to a more advanced program.

Prerequisites to admission to a major in chemistry are (1) Chemistry 115-116, or 107-108, or 103-104, 108 or, by petition, 103-108; (2) Physics 207; and (3) Mathematics 111. A student is not encouraged to undertake a major in chemistry unless he has passed the above courses at a good level of proficiency.

As a minimum the following additional courses must then be completed for a major in chemistry: (1) Chemistry 355-356, 357-358, 389-390, 339, 392; (2) Mathematics 112, 213; (3) Physics 208. This sequence is a core program in chemistry. It is anticipated that the student will, through elective courses, extend it substantially in whatever direction suits his own needs and interests. It is particularly important that those

going on to do graduate work in chemistry recognize that these requirements are minimal (indeed, they do not in themselves meet the standards recommended by the American Chemical Society for professional training), and such students are strongly urged to supplement their program, where possible, with Chemistry 479, 410, 468 and German (or Russian). Even students not planning graduate work in chemistry should consider advanced work in physics and mathematics, courses in the biological sciences, and advanced work in chemistry, as possible extensions of the basic program.

THE HONORS PROGRAM. The Honors program in chemistry offers superior students an opportunity to study independently in seminars and to gain additional experience by engaging in research during the senior year. It is particularly recommended to those who plan graduate work in chemistry. Prospective candidates for Honors should complete the Introductory Organic Chemistry and Physical Chemistry sequences by the end of their junior year. However, failure to have completed those courses in the junior year does not in itself disqualify a student from the Honors program. Completion of the program at a high level of performance leads to the degree of Bachelor of Arts with Honors in Chemistry. The requirements for admission to the Honors program are a cumulative average grade of at least B- and permission of the Department. Prospective candidates for Honors should discuss their plans with their advisers by March 1 of their junior year. Candidates for Honors must show outstanding performance in one of the following: 421, 433, 461, 477; and, in addition, 498.

DISTRIBUTION REQUIREMENT. The Distribution requirement in physical sciences is satisfied in chemistry by Chemistry 103-104, 107-108, or 115-116.

Students and members of the teaching staff are required to wear safety glasses or approved eye-protective devices in all chemistry laboratories. Those who fail to cooperate with the safety program may be asked to leave the laboratories.

General identification of the courses listed below is as follows:

Inorganic: 410, 411, 421, 505-506, 515, 516.

Analytical: 236, 339, 433, 525, 527, 528.

Organic: 353, 355, 356, 357-358, 457, 461, 465-466, 565, 566, 570, 572, 574.

Physical and Theoretical: 287-288, 289-290, 389-390, 392, 477, 479, 481, 578, 586, 589, 593, 594, 596, 598.

Bioorganic and Biophysical: 468, 572, 577, 582, 586.

103-104. INTRODUCTION TO CHEMISTRY

Throughout the year. Credit three hours a term. Chemistry 103 is prerequisite to Chemistry 104. Recommended for students who have not had high school chemistry and for those desiring a less mathematical course than Chemistry 107-108. Lectures, T Th 12:20. Laboratory, M W or F 1:25-4:25, W 10:10-1:10 or T F S 8-11. Scheduled preliminary examinations may be held in the evenings. If passed with a grade of C, this course serves as a prerequisite for

Chemistry 108 or Chemistry 353. Fall term, Mr. Sienko; spring term, Mr. Plane; and assistants.

An introduction to chemistry with emphasis on the important principles and facts of inorganic and organic chemistry.

107-108. GENERAL CHEMISTRY

Throughout the year. Credit three hours fall term and four hours spring term. Prerequisite, high school chemistry; 104 or 107 are prerequisites to 108. Enrollment is limited. Recommended for those students who will take further courses in chemistry. Lectures, T Th 9:05 and 10:10. Laboratory, W F or S 8-11; T or Th 1:25-4:25; M W or F 1:25-4:25; spring term: one additional recitation hour as arranged. Scheduled preliminary examinations may be held in the evening. Fall term, Mr. Kostiner; spring term, Mr. Sienko; and assistants.

The important chemical principles and facts are covered, with considerable attention given to the quantitative aspects and to the techniques that are important for further work in chemistry. Second-term laboratory includes a systematic study of qualitative analysis.

Note: Entering students exceptionally well prepared in chemistry may receive advanced credit for Chemistry 107-108 by demonstrating competence in the Advanced Placement Examination of the College Entrance Examination Board, or in advanced standing examination given at Ithaca on the Saturday before classes start in the fall.

115-116. GENERAL CHEMISTRY AND INORGANIC QUALITATIVE ANALYSIS

Throughout the year. Credit four hours in fall term, five in spring. Prerequisite, high school chemistry and physics at a grade of 90 or higher; Chemistry 115 is prerequisite to Chemistry 116. Coregistration in a calculus course at the level of Mathematics 111 or 191 and/or high school calculus required. Recommended for students who intend to specialize in chemistry or in closely related fields. Enrollment limited to 120. Fall term: lectures, M W F 12:20; one laboratory period, T or Th 10:10-1:10, W or F 8-11, or W or F 1:25-4:25. Spring term: lectures, M W 12:20. When announced in advance, quizzes, extra lectures or recitations will be F 12:20. Two laboratory periods, T Th 10:10-1:10; W F 8-11; W F 1:25-4:25; M T 1:25-4:25; or Th 1:25-4:25, S 8-11. Preliminary examinations will be given in the evening. Fall term, Mr. Hoffmann; spring term, Mr. Burlitch; and assistants.

An intensive, systematic study of the laws and concepts of chemistry, with considerable emphasis on mathematical aspects. Laboratory work will cover both qualitative and quantitative analysis.

236. INTRODUCTORY QUANTITATIVE ANALYSIS

Either term. Credit four hours. Prerequisite, Chemistry 108 or advanced placement in chemistry. Enrollment is limited. Lectures: T Th 12:20. Laboratory: fall term, M W or T Th 1:25-4:25; spring term, M W or T Th 1:25-4:25, or F 1:25-4:25 and S 8-11, if warranted by sufficient registration. Preliminary examinations may be given in the evening. Mr. McLafferty and assistants.

A study of the fundamental principles of quantitative chemistry. Laboratory experiments are designed to illustrate basic principles and practice of quantitative procedures.

287-288. INTRODUCTORY PHYSICAL CHEMISTRY

Throughout the year. Credit three hours a term. Prerequisites, Chemistry 108

or 116 and Mathematics 111-112 or consent of the instructor. Chemistry 287 is prerequisite to 288. Lectures, W F 9:05; occasional lectures and examinations, M 9:05. Recitation, M W or F 1:25. Fall term, Mr. Albrecht; spring term, Mr. Fisk; and assistants.

A systematic treatment of the fundamental principles of physical chemistry.

289-290. INTRODUCTORY PHYSICAL CHEMISTRY LABORATORY

Throughout the year. Credit two hours a term. Coregistration in Chemistry 287-288 required. Chemistry 289 is prerequisite to 290. Laboratory lecture, S 9:05. Laboratory, M T or W Th 1:25-4:25 or F 1:25-4:25, S 10-1. First hour of laboratory on M W or F devoted to Chemistry 287 recitation. Fall term, Mr. Fisk; spring term, Mr. Elson; and assistants.

The development of needed skills in the experimental aspects concerned with the fundamental principles of physical chemistry.

339. ANALYTICAL CHEMISTRY

Fall term. Credit four hours. Prerequisites, Chemistry 356 and Chemistry 391. Coregistration in the latter course is permitted. Required of candidates for the degree of A.B. with a major in chemistry. Lectures, M W F 9:05. Laboratory, one of the following periods: M T W Th F 1:25-4:25; or S 9:05-12:05. Mr. Morrison.

Examination of modern analytical chemistry. Laboratory work includes utilization of emission spectroscopy, polarography, spectrophotometry and nuclear magnetic resonance spectroscopy.

353. ELEMENTARY ORGANIC CHEMISTRY

Either term. Credit four hours. Prerequisite, Chemistry 104 at a grade of C or better, or 108, or 116. Primarily for students in the premedical and biological curricula. Parallel registration in Chemistry 355 is recommended. Lectures, M W F S 11:15. Scheduled preliminary examinations may be held in the evening. Fall term, Mr. Semmelhack; spring term, Mr. Blomquist.

An integrated study of aliphatic and aromatic organic compounds, their occurrence, methods of preparation, reactions, and uses.

The student should determine the entrance requirements for the particular medical school he wishes to enter. Students may obtain six hours credit by taking Chemistry 353-355. An additional two hours credit in laboratory may be obtained by taking Chemistry 356.

355. ELEMENTARY ORGANIC LABORATORY

Either term. Credit two hours. Prerequisite or parallel, Chemistry 353 or 357. Enrollment is limited; registrants who do not appear at the first meeting of their section will forfeit their registration. Required of candidates for the degree of B.Ch.E. or A.B. with a major in chemistry. Discussion-laboratory, M W 1:25-4:25; T Th 8-11; T Th 1:25-4:25; F 1:25-4:25, S 8-11. Scheduled preliminary examinations may be held in the evening. Fall term, Mr. Wilcox; spring term, Mr. Usher; and assistants.

An introduction to various laboratory techniques for the separation, purification, and analysis of organic compounds as these are applied to problems of natural products, of reaction kinetics, and of organic synthesis.

356. ELEMENTARY ORGANIC LABORATORY

Spring term. Credit two hours. Prerequisite, Chemistry 353-355. Enrollment is limited; registrants who do not appear at the first meeting of their section will forfeit their registration. Required of candidates for the degree of B.Ch.E. or A.B. with a major in chemistry. Discussion-laboratory, M W 1:25-4:25; T Th

8-11; T Th 1:25-4:25; F 1:25-4:25, S 8-11. Scheduled preliminary examinations may be held in the evening. Mr. Caldwell and assistants.

A laboratory course designed to illustrate both classical and spectroscopic methods for determining the structures of organic compounds.

357-358. INTRODUCTORY ORGANIC CHEMISTRY

Throughout the year. Credit three hours a term. Prerequisite, Chemistry 108, or 116, or advanced placement in chemistry. Chemistry 357 is prerequisite to Chemistry 358. Parallel registration in Chemistry 355-356 is recommended. Required of candidates for the degree of B.Ch.E. and A.B. with a major in chemistry. Lectures, M W F 9:05. Scheduled preliminary examinations may be held in the evening. Mr. Meinwald.

A systematic study of the more important classes of carbon compounds, reactions of their functional groups, methods of synthesis, relations, and uses.

389-390. PHYSICAL CHEMISTRY I and II

Throughout the year. Credit four hours a term. Prerequisites, Mathematics 213 or 221, Physics 208 or consent of the instructor. Chemistry 389 is prerequisite to 390. Required of candidates for the degree of A.B. with major in chemistry who are encouraged to coregister in Chemistry 392. Lectures, M W F 10:10. Examinations and make-up lectures, Th 7:30 p.m. Fall term, Mr. Scheraga; spring term, Mr. Fisher; and assistants.

A study of the more fundamental principles of physical chemistry from the standpoint of the laws of thermodynamics and statistical mechanics.

392. PHYSICAL CHEMISTRY LABORATORY

Spring term. Credit four hours. Chemistry 389-390 is prerequisite or coregistration. Laboratory lecture, Th 12:20. Laboratory, M T 1:25-4:25 or W F 1:25-4:25. Mr. Porter and assistants.

Experiments illustrating laboratory techniques as well as experiments in classical and modern physical chemistry.

410. INORGANIC CHEMISTRY

Spring term. Credit four hours. Prerequisite, Chemistry 290 or 392 or consent of the instructor. Lectures, M W F 9:05. Mr. Kostiner.

Lectures and assigned readings with emphasis on the application of thermodynamic, kinetic, and structural considerations to inorganic systems.

[411. INORGANIC CHEMISTRY LABORATORY]

Fall term. Credit four hours. Prerequisite or parallel course, Chemistry 389, 392, or consent of the instructor. Hours to be arranged. Not offered in 1969-70.

421. INTRODUCTION TO INORGANIC RESEARCH

Either term. Credit two or four hours. Prerequisites, Chemistry 389-390, 392 or 287-288, 289-290 at an average of B- or better and consent of the instructor. Hours to be arranged. Messrs. Burlitch, Fay, Kostiner, Plane, and Sienko.

Informal advanced laboratory and library work, planned individually in consultation with a staff member, involving the preparation and characterization of inorganic substances. A written report is required.

433. INTRODUCTION TO ANALYTICAL RESEARCH

Either term. Credit two or four hours. Prerequisite, Chemistry 390, 392 with an average of B- or better or consent of the instructor. Hours to be arranged. Messrs. Cooke, McLafferty, and Morrison.

Informal research in the field of analytical chemistry involving both laboratory and library work.

[457. ADVANCED ORGANIC-ANALYTICAL LABORATORY]

Spring term. Credit four hours. Primarily for seniors and graduate students in chemistry. Prerequisites, Chemistry 358 and Chemistry 339, or Chemistry 525, or consent of the instructor. Discussion, T Th 8. Laboratory, three of the following periods: T Th 8-11, M T W Th F 1:25-4:25, S 10:10-1:10. Not offered in 1969-70.

461. INTRODUCTION TO ORGANIC RESEARCH

Either term. Credit two to four hours. Prerequisites, 457 or consent of the instructor. Primarily for seniors and graduate students as preparation for advanced and independent work. Enrollment limited for undergraduates to those having a record of B- or better in prerequisite courses. Laboratory and weekly discussion meeting, hours to be arranged. Messrs. Blomquist, Caldwell, Goldstein, Meinwald, Miller, Muxfeldt, Semmelhack, Usher, and Wilcox.

465-466. ORGANIC CHEMISTRY

Throughout the year. Credit four hours a term. Prerequisite, Chemistry 358. Chemistry 465 is prerequisite to 466. Primarily for juniors, seniors, and graduate students. Enrollment limited for undergraduates to those having a record of B- or better in previous courses in organic chemistry. Lectures, M W F 12:20. Discussion, to be arranged. Mr. Goldstein.

Fall term: structural theory; resonance; methods of structure determination; conformational analysis and other aspects of stereo-chemistry; introduction to reaction mechanisms; synthesis and characteristic reactions of hydrocarbons. Spring term: synthesis and reactions of the principal classes of organic compounds, with an emphasis on newer developments; the application of mechanistic reasoning to synthetic problems; multi-step syntheses.

468. CHEMICAL ASPECTS OF BIOLOGICAL PROCESSES

Fall term. Credit four hours. Prerequisites, Chemistry 358 and 390-392, or their equivalents. Primarily for graduate students. Lectures, M W F 9:05. Mr. Usher.

Bioenergetics, metabolic pathways, origin of life. This course forms the chemical basis for the graduate program in molecular biology.

477. INTRODUCTION TO RESEARCH IN PHYSICAL CHEMISTRY

Either term. Credit two to four hours. Prerequisite, Chemistry 390 at an average of B- or better and consent of instructor. Hours to be arranged. Messrs. Albrecht, Bauer, Elson, Fisher, Freed, Fisk, Hammes, Hoard, Hoffmann, Hughes, Long, Porter, Rye, Scheraga, and Widom.

Informal advanced laboratory and library work in physical chemistry, planned individually in consultation with a staff member.

[479. PHYSICAL CHEMISTRY III]

Spring term. Credit four hours. Prerequisites, Chemistry 108 or 116, Mathematics 213, and Physics 208, or consent of the instructor. Not offered in 1969-70.

481. ADVANCED PHYSICAL CHEMISTRY

Fall term. Credit four hours. Prerequisite, Chemistry 288 or 390. Lecture, M W F 9:05. Discussion section to be arranged. Mr. Widom.

A discussion of advanced topics in physical chemistry, including an introduction to the principles of quantum theory and statistical mechanics, atomic and molecular spectra, and elementary valence theory.

498. HONORS SEMINAR AND RESEARCH

Spring term. Credit four hours. Prerequisite, admission to the Honors program. Seminar, W 2:30. Laboratory hours to be arranged. Messrs. Blomquist and Hammes.

The seminar will be an informal presentation and discussion of selected topics in which all members participate. Individual research will be on advanced problems in chemistry under the guidance of a staff member. A written report on the research results is required.

505-506. ADVANCED INORGANIC CHEMISTRY

Throughout the year. Credit four hours a term. Prerequisite or parallel course, Chemistry 389-390 or 287-288, or consent of the instructor. Chemistry 505 is prerequisite to Chemistry 506. Open to juniors, seniors, and graduate students. Lectures, M W F 11:15. Fall term, Mr. Burlitch; spring term, to be announced.

For description see the *Announcement of the Graduate School: Physical Sciences*.

515-516. SELECTED TOPICS IN ADVANCED INORGANIC CHEMISTRY

Throughout the year. Credit two hours a term. Students may register for either term separately. Prerequisite, Chemistry 390. Lectures, T Th 12:20. Fall term, Mr. Porter; spring term, Mr. Rye. Only grades of S or U will be given.

525. ADVANCED ANALYTICAL CHEMISTRY I

Fall term. Credit four hours. Prerequisite, Chemistry 288 or 390. For graduate students only except by consent of the instructor. Lectures, M W F 8. Examinations, T 7:30 P.M. Mr. Cooke.

For description see the *Announcement of the Graduate School: Physical Sciences*.

[527. ADVANCED ANALYTICAL CHEMISTRY II]

Spring term. Credit three hours. Prerequisite, Chemistry 288 or 390. Primarily for graduate students. Lectures, T Th 9:05. Messrs. McLafferty and Morrison. Offered in alternate years. Not offered in 1969-70.

528. ADVANCED ANALYTICAL CHEMISTRY III

Spring term. Credit three hours. Prerequisite, Chemistry 288 or 390. Primarily for graduate students. Lectures, T Th 9:05. Messrs. McLafferty and Morrison. Offered in alternate years.

Modern analytical methods, including electroanalytical, diffraction, and separation techniques; ultratrace analysis; Mössbauer and Fourier spectroscopy; microscopy.

565. PHYSICAL ORGANIC CHEMISTRY I

Fall term. Credit four hours. Prerequisite, Chemistry 465-466 or consent of the instructor. Primarily for graduate students. Lectures, M W F 12:20. Mr. Caldwell.

For description see the *Announcement of the Graduate School: Physical Sciences*.

[566. PHYSICAL ORGANIC CHEMISTRY]

Spring term. Credit three hours. Prerequisite, Chemistry 565 or consent of the instructor. Primarily for graduate students. Lectures, T Th 12:20. Not offered in 1969-70.

[570. SELECTED TOPICS IN ORGANIC CHEMISTRY]

Fall term. Credit three hours. Prerequisites, 465-466 or consent of instructor. Primarily for graduate students. Not offered in 1969-70.

572. ENZYME CATALYSIS

Spring term. Credit four hours. Prerequisites, Chemistry 357-358 or equivalent, and a course in general biochemistry. Primarily for graduate students in chemistry and biochemistry. Lectures, M W F 11:15. Mr. Hammes.

Enzymes, coenzymes and model systems.

[574. CHEMISTRY OF NATURAL PRODUCTS]

Fall term. Credit three hours. Prerequisites, Chemistry 457, and 465-466. Primarily for graduate students. Lectures, T Th 12:20 and discussion period, M 4:30. Not offered in 1969-70.

577. CHEMISTRY OF NUCLEIC ACIDS

Fall term. Credit four hours. Prerequisites, Chemistry 358 and 390, or their equivalents. Primarily for graduate students. Lectures, T Th S 8. Mr. Elson. Only grades of S or U will be given.

Properties, synthesis, and reactions of nucleic acids.

578. THERMODYNAMICS

Spring term. Credit four hours. Prerequisite, 288 or 390. Primarily for graduate students. Lectures, T Th S 10:10, and a discussion period to be arranged. Mr. Hoard.

For description see the *Announcement of the Graduate School: Physical Sciences*.

580. KINETICS OF CHEMICAL REACTIONS

Fall term. Credit four hours. Prerequisites, Chemistry 481 and 578, or consent of the instructor. Lectures, M W F 9:05. Mr. Hammes.

A general discussion of rates of reactions, including types of reactions, methods of measurement, theories of reaction rates, applications to problems.

582. SPECIAL TOPICS IN MOLECULAR BIOLOGY

Fall term. No credit. Prerequisite, Chemistry 468 or consent of the instructor. Primarily for graduate students. Topics to be announced. Lectures, T Th S 11:15. Mr. Jencks, Brandeis University.

For description see the *Announcement of the Graduate School: Physical Sciences*.

[586. PHYSICAL CHEMISTRY OF PROTEINS]

Spring term. Credit four hours. Prerequisite, Chemistry 288 or 390. Primarily for graduate students. Lectures, M W F 8 and S 9:05; occasional lectures, W 7:30 P.M. Not offered in 1969-70.

589. X-RAY CRYSTALLOGRAPHY

Fall term. Credit four hours. Prerequisite, Physics 322 or consent of the instructor. M W F 12:20. Offered in alternate years. Mr. Hoard.

Space groups, reciprocal lattices, three-dimensional diffraction, interpretation of x-ray diffraction data, structure determination by Fourier synthesis.

593. QUANTUM MECHANICS I

Fall term. Credit four hours. Prerequisites, Chemistry 479 and Physics 303

(or coregistration in Physics 319) or their equivalents, and coregistration in Mathematics 421 (or equivalent), or consent of the instructor. Lectures, T Th 8-9:55. Mr. Fisher.

Schrödinger's equation, wave packets, uncertainty principle, WKB theory. Matrix mechanics, orbital and spin angular momentum, exclusion principle, perturbation theory, variational principle, Born-Oppenheimer approximation. At the level of Bohm, *Quantum Theory*.

594. QUANTUM MECHANICS II

Spring term. Credit four hours. Prerequisite, Chemistry 593 or its equivalent. Lectures, M W F 10:10. Mr. Albrecht.

Time-dependent phenomena in quantum mechanics and interaction with radiation. Group theory and applications. Topics in molecular quantum mechanics. At the level of Tinkham, *Group Theory and Quantum Mechanics*.

596. STATISTICAL MECHANICS

Spring term. Credit four hours. Prerequisite, Chemistry 593 or equivalent is desirable but not required. Primarily for graduate students. Lectures, M W F 9:05. Mr. Widom.

Ensembles and partition functions. Thermodynamic properties of ideal gases and crystals. Third law of thermodynamics, equilibrium constants, vapor pressures, imperfect gases, and virial coefficients. Distribution and correlation functions. Lattice statistics and phase transitions. Bose-Einstein and Fermi-Dirac ideal gases. Maxwell theory of viscosity and heat conduction. At the level of T. L. Hill, *Statistical Thermodynamics*.

598. SELECTED TOPICS IN PHYSICAL CHEMISTRY

Fall term. Credit two hours. Lectures, T Th 12:20. Mr. Porter. Only grades of S or U will be given.

Detailed consideration is given to special topics selected from the field of theoretical and experimental physical chemistry. Topics are varied from year to year.

600. GENERAL CHEMISTRY SEMINAR

Throughout the year. No credit. Th 4:40. A series of talks representative of all fields of current research interest in chemistry, given by advanced graduate students, research associates, faculty members, and distinguished visitors. Mr. McLafferty.

601-602. INTRODUCTORY GRADUATE SEMINAR IN ANALYTICAL, INORGANIC AND PHYSICAL CHEMISTRY

Throughout the year. No credit. Hours to be arranged. Required of all first-year graduate students majoring in analytical, inorganic, physical, and theoretical chemistry, and molecular biology. Mr. Hughes.

Weekly seminars on contemporary topics prepared and presented by first-year graduate students. Attention given to details of selecting, preparing, and presenting a given topic. Group preparation and participation emphasized.

650-651. GRADUATE SEMINAR IN ORGANIC CHEMISTRY

Throughout the year. No credit. Open to qualified juniors, seniors, and graduate students. Required of all graduate students majoring in organic chemistry. M 8:15 P.M. Mr. Gurowitz.

700. BAKER LECTURES

No credit. T Th 11:15. Fall term: H. C. Brown, Purdue University.

THE CLASSICS

Mr. G. M. Kirkwood, Chairman; Messrs. D. C. Earl, J. Hutton, G. M. Messing, Miss Elizabeth Milburn, Messrs. P. Pucci, N. Robertson, E. W. Spofford, L. L. Threatte, F. O. Waage.

CLASSICS. Those whose major study is in the Classics must complete twenty-four hours of advanced courses in Greek and Latin (courses numbered above 201) and fifteen hours, selected after conference with the adviser, in related subjects. Related subjects for this purpose are all courses listed below under Classical Linguistics and Classical Civilization, also ancient philosophy and selected courses in comparative literature, linguistics, modern foreign languages and literatures, and Semitic studies.

CLASSICAL CIVILIZATION. Those whose major study is in Classical Civilization must complete (a) eighteen hours in Latin or Greek; (b) twenty hours selected from the courses listed below under Classical Civilization; and (c) twelve hours in related subjects. Related subjects for this purpose may be any courses in the humanities but selected in conference with the adviser so as to form a coherent and significant experience in the relation between antiquity and subsequent periods in the Western tradition; they may include courses listed under Classical Civilization which have not been used to satisfy requirement (b).

THE HONORS PROGRAM. Candidates for the degree of Bachelor of Arts with Honors in Classics or Bachelor of Arts with Honors in Classical Civilization must fulfill the requirements of the appropriate major study, as prescribed in the foregoing paragraphs, and must also complete successfully the special Honors Courses 370, 371, and 372. Credit for Honors courses may be included in the hours required for the major study. Students who wish to become candidates for Honors and who have a cumulative average of B- or better should consult some member of the Department before preregistering for the second term of the junior year.

DISTRIBUTION REQUIREMENT. The Distribution requirement in the Humanities is satisfied in Classics by any two courses in Greek or in Latin beginning with 201 that form a reasonable sequence; but no course may be used for this requirement if it has been used for the language requirement.

Greek

101. GREEK FOR BEGINNERS

Either term. Credit three hours. M W F 12:20.

Introduction to Attic Greek. Designed to enable the student to read the ancient authors as soon as possible.

103. ATTIC GREEK

Either term. Credit three hours. Prerequisite, Greek 101. M W F 12:20. Fall term, Mr. Threatte.

Continuation of Greek 101, and readings in Plato.

201. ATTIC AUTHORS: PLATO, APOLOGY; EURIPIDES, MEDEA

Fall term. Credit three hours. Prerequisite, Greek 103. T Th S 9:05.

Attention is given both to the exact understanding of the Greek texts and to relevant broad literary and historical questions.

203. HOMER

Spring term. Credit three hours. Prerequisite, Greek 103. T Th S 9:05. Mr. Hutton.

Readings in Homeric epic, and consideration of such literary problems as the authorship, unity, and style of the epics and their relation to oral and literary epic.

209-210. GREEK COMPOSITION

Throughout the year. Credit one hour a term. Prerequisite, Greek 103 or the equivalent. W 2:30.

An exercise course, meeting once a week, to provide review and further study of the forms and, more especially, the syntax of ancient Greek. Recommended as a companion course to Greek 201 and 203.

301. HERODOTUS AND SOPHOCLES

Fall term. Credit four hours. Prerequisite, Greek 203. T Th S 10:10. Mr. Kirkwood.

302. THUCYDIDES AND THE GREEK ORATORS

Spring term. Credit four hours. Prerequisite, Greek 203. T Th S 10:10. Mr. Pucci.

[305. AESCHYLUS, ARISTOPHANES, LYRIC POETS]

Fall term. Credit four hours. Prerequisite, Greek 203. Not offered in 1969-70.

[306. PHILOSOPHICAL WRITERS]

Spring term. Credit four hours. Prerequisite, Greek 203. Not offered in 1969-70.

409-410. ADVANCED GREEK COMPOSITION

Throughout the year. Credit one hour a term. Prerequisite, Greek 209-210 or the equivalent. Th 12:20. Fall term, Mr. Pucci. Spring term, Mr. Hutton.

442. GREEK PHILOSOPHY

Spring term. Credit four hours. Prerequisite, two terms of Greek at the 300 level. T Th S 11:15.

Topic and instructor for 1970 to be announced.

501-502. INDEPENDENT STUDY FOR GRADUATE STUDENTS**SEMINARS FOR GRADUATE STUDENTS****569. THE ATTIC ORATORS**

Fall term. Credit four hours. Hours to be arranged. Mr. Threatte.

570.

Spring term. Credit four hours. Topic to be announced. Hours to be arranged. Mr. Earl.

571. MENANDER

Fall term. Credit four hours. Th 3:35-5:30. Mr. Hutton.

572. HESIOD

Spring term. Credit four hours. Th 3:35-5:30. Mr. Robertson.

Latin

Final placement in freshman Latin courses, other than beginning Latin, is determined by an examination administered by the Department of Classics in the first week of the fall term. Tentative placement is made on the basis of the previous training listed below as prerequisite for each course and of College Board Achievement Test scores.

105-106. LATIN FOR BEGINNERS

Throughout the year. Credit three hours a term. T Th S 11:15.

An introductory course in the essentials of the Latin language, designed for rapid progress toward reading the principal Latin authors. Readings in the second term from Caesar and short selections from various prose authors.

107. FRESHMAN COURSE: SELECTIONS FROM VIRGIL AND CICERO

Fall term. Credit three hours. Prerequisite, Latin 106 or two units of entrance Latin. M W F 9:05. T Th S 10:10.

Begins with a comprehensive but rapid review of the fundamentals of Latin, but is principally a reading course. An oration of Cicero and selections from the *Aeneid*.

108. FRESHMAN COURSE: SALLUST AND TACITUS

Spring term. Credit three hours. Prerequisite, Latin 107 or three units of entrance Latin. T Th S 10:10.

Tacitus' *Agricola* or *Germania*; readings from Sallust's *Catiline* or *Jugurtha*.

201. CATULLUS, CICERO, HORACE

Fall term. Credit three hours. Prerequisite, Latin 108 or three or (preferably) more units of entrance Latin. M W F 9:05, 11:15. Mr. Pucci and Mr. Threatte.

Primarily intended for freshmen, and constituting, with 202, an introduction to Latin literature in its greatest epoch, at the end of the Republic and the beginning of the Empire. Reading consists of selections from the lyric poetry of Catullus and Horace, and either letters or an essay of Cicero.

202. THE AUGUSTAN AGE

Spring term. Credit three hours. Prerequisite, Latin 201. M W F 9:05, 11:15. Mr. Earl and another member of the faculty.

Selections from Suetonius' *The Deified Augustus*, Ovid's *Ars Amatoria* or *Metamorphoses*, and Virgil's *Eclogues*.

205. ROMAN COMEDY

Fall term. Credit three hours. Prerequisite, Latin 202 or the equivalent; open

to freshmen by Advanced Placement Examination or by exceptionally high standing in the Departmental placement examination. M W F 10:10.

Plautus and Terence; at least one comedy of each playwright.

206. VIRGIL AND LIVY

Spring term. Credit three hours. Prerequisite, Latin 205. M W F 10:10. Mr. Robertson.

A book, or selections, of Livy's history of Rome; readings in Virgil's *Georgics*.

221-222. LATIN COMPOSITION

Throughout the year. Credit one hour a term. Prerequisite, Latin 202 or special permission. F 2:30.

An exercise course, meeting once a week, to provide review and further study of the forms and, more especially, the syntax of Latin. Recommended as a companion course to Latin 205-206.

[315. LUCRETIUS' *DE RERUM NATURA* AND CICERO'S PHILOSOPHICAL WORKS]

Fall term. Credit four hours. Prerequisite, Latin 206. Not offered in 1969-70.

[316. VIRGIL'S *AENEID*]

Spring term. Credit four hours. Prerequisite, Latin 315 or the equivalent. Not offered in 1969-70.

317. TACITUS AND SENECA

Fall term. Credit four hours. Prerequisite, Latin 206. M W F 11:15. Mr. Earl.

318. ELEGIAC POETS, PETRONIUS, APULEIUS

Spring term. Credit four hours. Prerequisite, Latin 317 or the equivalent. M W F 11:15. Mr. Messing.

367-368. MEDIEVAL LATIN LITERATURE

Throughout the year. Credit four hours a term. Prerequisite, three years of high school Latin or consent of the instructor. Hours to be arranged. Fall term, Mr. Messing. Spring term, Mr. Wetherbee.

431-432. LATIN COMPOSITION: ADVANCED COURSE

Throughout the year. Credit one hour a term. For undergraduates who have completed Latin 221-222 and for graduate students. T 12:20. Mr. Earl.

451-452. INDEPENDENT STUDY

For qualified majors.

551-552. INDEPENDENT STUDY FOR GRADUATE STUDENTS

SEMINARS FOR GRADUATE STUDENTS

579. CICERO'S LETTERS

Fall term. Credit four hours. Hours to be arranged. Mr. Hutton.

580.

Spring term. Credit four hours. Hours to be arranged. Topic and instructor to be announced.

581.

Fall term. Credit four hours. T 3:35-5:30. Topic to be announced. Mr. Earl.

582.

Spring term. Credit four hours. Topic to be announced. T 3:35-5:30. Mr. Pucci.

Honors Courses

370. HONORS COURSE

Spring term. Credit four hours. To be taken in the junior year.

A program of readings and conferences centered in an author or a topic chosen in accordance with the special interests of the students and instructor.

371. HONORS COURSE

Fall term. Credit four hours. To be taken in the senior year.

Continuation of 370, with change of author or topic.

372. HONORS COURSE: SENIOR ESSAY

Spring term. Credit four hours. For students who have successfully completed Classics 371. Topics must be approved by the Honors adviser at the end of the first term of the senior year.

Classical Linguistics

421-422. HISTORICAL GRAMMAR OF GREEK AND LATIN

Throughout the year. Credit four hours a term. Prerequisite, consent of the instructor. T Th S 10:10. Mr. Messing.

Fall term: phonology. Spring term: morphology and syntax. The linguistic analysis of Greek and Latin sounds and forms and their historical development. The course will thus offer the student an insight into the methods of comparative linguistics as applied to Greek and Latin.

[423. VULGAR LATIN]

Fall term. Credit four hours. Prerequisite, consent of the instructor. Not offered in 1969-70.

[424. ITALIC DIALECTS]

Spring term. Credit four hours. Prerequisite, consent of the instructor. Not offered in 1969-70.

Classical Civilization

119. FRESHMAN SEMINAR IN GREEK LITERATURE

Fall term. Credit three hours. Mr. Robertson.

For description, see Freshman Humanities Program, p. 33.

120. FRESHMAN SEMINAR IN LATIN LITERATURE

Spring term. Credit three hours.

For description, see Freshman Humanities Program, p. 33.

INTRODUCTION TO ARCHAEOLOGY

(Archaeology 200)

319. PRECLASSICAL GREECE

Fall term. Credit four hours. M W F 10:10. Miss Milburn.

Aegean archaeology from the Neolithic period to the eighth century B.C.

320. ARCHAEOLOGY OF CLASSICAL GREECE

Spring term. Credit four hours. M W F 10:10. Mr. Threutte.

Study of select monuments of ancient Greece from the eighth century to the Hellenistic period.

GREEK RELIGIOUS THOUGHT

(Comparative Literature 323)

HUMANISM AND THE RENAISSANCE

(Comparative Literature 340)

ANCIENT AND RENAISSANCE LITERARY CRITICISM

(Comparative Literature 401)

[GREEK AND ROMAN DRAMA]

(Comparative Literature 400)

Not offered in 1970.

ANCIENT HISTORY

(History 301-302)

THE ROMAN REPUBLIC, 133-30 B.C.

(History 431)

GREEK HISTORY, 500-336 B.C.

(History 432)

ORIGINS OF WESTERN POLITICAL THOUGHT

(Government 462)

COMPARATIVE LITERATURE

Messrs. M. H. Abrams, B. B. Adams, H. D. Albright, G. P. Biasin, E. A. Blackall, A. Caputi, Miss Patricia Carden, Messrs. M. A. Carlson, C. M. Carmichael, W. Chalsma, Miss Alice Colby, Messrs. D. Connor, J. B. Dallett, H. Deinert, H. Dieckmann, J. M. Echols, S. B. Elledge, H.-J. Frey, A. Gelley, G. Gibian, P. A. Gottschalk, D. I. Grossvogel, N. Hertz, T. D. Hill, M. Horwitz, J. Hutton, A. Ivry, Mrs. Carol Kaske, Messrs. R. E. Kaske, G. M. Kirkwood, E. P. Morris, I. Rabinowitz, K.-L. Selig, H. Shadick, E. W. Spofford, B. O. States, Mrs. Etsuko Terasaki, Messrs. R. G. Williams, W. Wetherbee III.

The Department of Comparative Literature offers no major program; certain of its courses may, however, be counted toward the major requirements of other departments, at their option. For information

consult the English, Classics, French, Russian and German sections in this *Announcement*.

Related courses: consult the offerings in Classics, English, German, Romance Studies, Russian, Semitic Studies, Asian Studies, History, Philosophy, the Fine Arts, Music, and Theatre Arts.

DISTRIBUTION REQUIREMENT. The Distribution requirement in the humanities may be satisfied by any of the 200- or 300-level courses in literature which form a sequence.

101-102. FRESHMAN SEMINAR IN WESTERN LITERATURE

Credit three hours a term.

For description, see Freshman Humanities Program, p. 33.

FRESHMAN SEMINAR IN GERMAN LITERATURE

(German 103-104)

Credit three hours a term.

For description see Freshman Humanities Program, p. 36.

FRESHMAN SEMINAR IN GREEK LITERATURE

(Classics 119)

Fall term. Credit three hours.

For description, see Freshman Humanities Program, p. 33.

FRESHMAN SEMINAR IN LATIN LITERATURE

(Classics 120)

Spring term. Credit three hours.

For description, see Freshman Humanities Program, p. 33.

CLASSICS OF JEWISH AND ISLAMIC THOUGHT

(Semitics 107)

Fall term. Credit three hours.

For description see Freshman Humanities Program, p. 37.

THE LITERATURE OF THE NEW TESTAMENT

(Semitics 110)

Spring term. Credit three hours.

For description see Freshman Humanities Program, p. 37.

201-202. WESTERN LITERATURE

Throughout the year. Credit three hours a term. Each section limited to twenty students. M W F 9:05, 10:10, 11:15, 12:20. T Th S 9:05, 10:10, 11:15. Staff.

Study and discussion in small sections of selected great books of the Western tradition. Fall term: the *Iliad*, the *Aeneid*, selections from the Bible, *The Divine Comedy*, *Paradise Lost*, and *Faust*. Spring term: Sections 1, 3, 5, 7, a selection of narrative and dramatic works designed to provide a comparative history of modes of perception, ways of knowing and defining the world, central to the career of Western self-consciousness; Sections 2, 4, 6, a selection of narrative and dramatic works designed to suggest the dimensions and implications of the tragic mode in literature.

207-208. RUSSIAN LITERATURE

Throughout the year. Credit three hours a term. Enrollment limited to sixty

students. First term or the consent of the instructor prerequisite to the second. M W F 12:20. Miss Carden.

Readings in English translation. Fall term: Pushkin, Gogol, Turgenev and Goncharov. Spring term: Dostoevsky, Tolstoy, Chekhov, Babel and Pasternak.

301. THE LITERATURE OF THE OLD TESTAMENT

Fall term. Credit four hours. M W F 9:05. Mr. Rabinowitz.

Readings, in translation, from books of the Old Testament composed during the pre-exilic period of Israel's history (to c. 520 B.C.). The various genres of classical Hebrew literature, and the ancient Israelite ideas and institutions essential to comprehension of the texts will be studied.

[302. THE LITERATURE OF POST-EXILIC ISRAEL]

Spring term. Credit four hours. For sophomores, juniors and seniors. M W F 9:05. Mr. Rabinowitz. Not offered in 1969-70.

303. LITERARY STUDIES IN CHRISTIAN ORIGINS

Fall term. Credit four hours. M W F 10:10. Mr. Carmichael.

Analysis of important ideas in the New Testament and early Christianity in relation to their appearance in the Old Testament and other ancient Near Eastern literature.

304. THE RATIONAL TRADITION IN JEWISH AND ISLAMIC LITERATURE

Spring term. Credit four hours. M W F 11:15. Mr. Ivry.

Topics illustrative of the attempt within Judaism and Islam to locate religious tradition in a rational framework.

[313-314. ENGLISH TRANSLATION OF GREEK AND LATIN CLASSICS]

Throughout the year. Credit four hours a term. For juniors and seniors only. First term prerequisite to the second. Not offered in 1969-70.

323. GREEK RELIGIOUS THOUGHT

Fall term. Credit four hours. For sophomores, juniors and seniors. T Th S 11:15. Mr. Robertson.

An examination of the historical origins of religious attitudes and beliefs which have been influential in later times; some emphasis is put on the social and material circumstances predisposing men to various kinds of religion. Not only forms of worship and open expressions of belief, but also patterns of myth are traced through a selection of Greek writings in translation. These include Homer, Hesiod, Pindar, Aeschylus, Euripides, Aristophanes and Plato.

325-326. WORLD DRAMA

Throughout the year. Credit four hours a term. M W F 10:10. Fall term, Mr. Caputi. Spring term, Mr. States.

An introduction to representative types and forms of drama, designed to increase appreciation of the drama as literature and of the theatre as an art form and social institution. Fall term: readings from Greece, Rome, the Middle Ages, the Renaissance and the seventeenth century. Spring term: readings from the Restoration to contemporary drama.

329-330. THE LITERATURE OF EUROPE IN THE MODERN PERIOD

Throughout the year. Credit four hours a term. First term not prerequisite to the second. T Th S 10:10. Fall term, Mr. Williams. Spring term, Mr. Gottschalk.

Fall term: reading of such representative authors as Chrétien de Troyes, Guillaume de Lorris, Dante, Chaucer, Malory, Castiglione, Tasso, Erasmus, Rabelais, Montaigne, Shakespeare, Marlowe, and Donne. Emphasis will be on the emergence of modern attitudes toward the individual, love, and social institutions. Spring term: reading of such representative authors as Fielding, Diderot, Goethe, Byron, Stendhal, Dostoevsky, Nietzsche, Mallarmé, Chekhov, and Shaw.

333-334. MEDIEVAL LITERATURE

Throughout the year. Credit four hours a term. M W F 12:20. Fall term, Mr. Kaske. Spring term, to be announced.

Fall term: analysis and interpretation of great medieval literary works in translation. Though readings will vary somewhat from year to year, a typical program would be *Beowulf*; *Chanson de Roland*; *Njáls saga*; a romance of Chrétien; Wolfram's *Parzival*; Gottfried's *Tristan*, and/or *Sir Gowain and the Green Knight*; *Pearl*; *Piers Plowman*. Spring term: topic to be announced.

340. HUMANISM AND THE RENAISSANCE

Spring term. Credit four hours. M W F 10:10. Mr. Hutton.

Readings in translation from Petrarch, Erasmus, Ariosto, Rabelais, Tasso, Montaigne, and others, designed to bring out typical ideas and attitudes of the Renaissance period. Attention will be given to such topics as fifteenth-century humanism, neo-Latin literature, Ciceronianism, Renaissance Platonism, theories of poetry, the influence of the Counter-Reformation.

347. EUROPEAN DRAMA 1660-1800

Fall term. Credit four hours. M W F 1:25. Prerequisite, reading knowledge of either French or German. Mr. Carlson.

A study of the four major dramatic genres in France, Germany and England of this period: neoclassic, comedy of manners, sentimental comedy, and bourgeois tragedy.

351-352. THE MODERN EUROPEAN NOVEL

Throughout the year. Credit four hours a term. M W F 12:20. Fall term: to be announced. Spring term: to be announced.

Fall term: novels by Laclos, Goethe, Stendhal, Balzac, Flaubert, Zola, Proust, and Kafka. Spring term: emphasis on Russian and English fiction. Readings by Lermontov, Turgenev, Tolstoy, Dostoevsky, Dickens, Gissing, Forster and others.

[354. DON QUIXOTE]

Spring term. Credit four hours. Enrollment limited to fifty students. M W F 2:30. Mr. Selig. Not offered in 1969-70.

358. IDEA AND FORM IN MODERN EUROPEAN LITERATURE

Spring term. Credit four hours. Enrollment limited to fifty students. T Th S 10:10.

An experimental examination of the modern consciousness in literature. Readings will include Gertrude Stein, *Three Lives*; Rilke, *Malte Laurids Briggé*; Gide, *Lafcadio's Adventures*; Sartre, *Nausea*; Musil, *Five Women*; and stories by Borges, Flannery O'Connor, and others.

367. THE RUSSIAN NOVEL

Fall term. Credit four hours. T Th S 9:05. Mr. Chalsma.

Works by Turgenev, Dostoevsky, and Tolstoy.

368. SOVIET LITERATURE

Spring term. Credit four hours. M W F 10:10. Mr. Gibian.

An introduction to selected works of Russian literature, from 1917 to date, examined as works of art and as social and historical documents.

371. CHINESE HISTORICAL AND PHILOSOPHICAL LITERATURE

Fall term. Credit four hours. M W F 10:10. Mr. Shadick.

Readings in English translation of Confucian, Taoist, and Buddhist works.

372. CHINESE IMAGINATIVE LITERATURE

Spring term. Credit four hours. M W F 10:10. Mr. Shadick.

Readings in English translation of poetry, classical prose, fiction, drama and the new writing of the twentieth century.

375-376. JAPANESE LITERATURE

Throughout the year. First term not prerequisite to the second. Credit four hours. M W F 11:15. Mrs. Terasaki.

Readings in English translation. Fall term: early poetry and prose; court diaries, *Pillow Book* of Sei Shōnagon, *Tale of Genji*; war epics, Nō drama, linked-verse. Spring term: popular novels, puppet and Kabuki plays, and "haiku" of the Tokugawa period (1603-1867); Meiji and later Western-influenced novels and poetry.

379. SOUTHEAST ASIAN LITERATURE

Fall term. Credit four hours. T 2:30-4:25. Mr. Echols.

Readings in English translation. A survey of the literatures of Southeast Asia with special attention to several masterpieces.

[400. GREEK AND ROMAN DRAMA]

Spring term. Credit four hours. T Th 10:10-11:20. Mr. Kirkwood. Not offered in 1970.

A study, by lecture and discussion, of the evolution of forms and meanings in ancient tragedy and comedy as exemplified by the works of Aeschylus, Sophocles, Euripides, Aristophanes, Menander, Plautus, Terence and Seneca. Representative plays are read in translation. Consideration is given also to the origins of tragedy and comedy, and to the ancient theatre.

401. ANCIENT AND RENAISSANCE LITERARY CRITICISM

Fall term. Credit four hours. M W F 9:05. Mr. Williams.

A study of ancient and Renaissance poetic and rhetorical theory, with special reference to Plato, Aristotle, Horace, Quintilian, and Longinus, and to Scaliger and Castelvetro as Renaissance interpreters of the classical formulation.

402. ALLEGORY AND SYMBOLISM

Spring term. Credit four hours. M W F 10:10. Mrs. Kaske.

Definitions and models drawn from the *Divine Comedy* will be related to a reading of works ranging from classical to modern, such as Prudentius' *Psychomachia*, the *Romance of the Rose*, mystical lyrics of St. John of the Cross and others, the *Faerie Queene*, *Faust Part II*, and selected works of Kafka.

404. MEDIEVAL ARTHURIAN LITERATURE

Spring term. Credit four hours. T Th S 10:10. Mr. Wetherbee.

A survey of Arthurian literature from the twelfth to the fifteenth century. Special attention will be given to the relations of the English and French

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Arthurian traditions. Reading will include selections from the *Mabinogion*, the Didot *Perceval*, the Middle English alliterative *Morte Arthure*, *Sir Gawain and the Green Knight*, and works of Marie de France, Chrétien de Troyes, Chaucer and Sir Thomas Malory.

[409. POST-SYMBOLIST POETRY]

Fall term. Credit four hours. M W F 10:10. Not offered in 1969-70.

413. MODERN ITALIAN LITERATURE

Fall term. Credit four hours. M 2:30-4:25. Mr. Biasin.

A thematic study of such authors as Verga, Svevo, Pirandello, Tomasi de Lampedusa, Bassani, Pavese, and Moravia. Readings, lectures, and discussion in English.

416. MYTH AND LITERATURE

Spring term. Credit four hours. Enrollment limited to juniors, seniors and graduate students. M W F 1:25. Mrs. Siegel.

Readings in mythography, literature and criticism in the twentieth century. Emphasis will be on Yeats and Stevens.

442. MODERN DRAMATISTS

Spring term. Credit four hours. M W F 1:25. Mr. Carlson.

Topic for 1969-70: Ibsen and Strindberg. All readings in English translation.

[460. UTOPIAS AND IMAGINARY VOYAGES IN THE BAROQUE AGE AND THE ENLIGHTENMENT]

Spring term. Credit four hours. M W F 11:15. Mr. Dallett. Not offered in 1969-70.

466. THE NOVEL IN THE ROMANTIC PERIOD

Spring term. Credit four hours. M W 1:25-2:35. Mr. Gelley.

A study of various traditions of the novel in the period (epistolary, Gothic, etc.) and analysis of works by Goethe, Jean Paul, Novalis, Hoffmann, Nerval, Constant, Hugo, Scott.

469. TOPICS IN EUROPEAN FICTION

Fall term. Credit four hours. M W 10:10-12:05. Mr. Hertz.

Topic for 1969: the novels of George Eliot and of Flaubert.

THE GREAT MOMENTS OF GERMAN LITERATURE

(German 417-418)

Throughout the year. Credit four hours a term. Recommended for graduate students and undergraduate students, whether majoring in German or not, who wish to acquire an overall view of the whole range of German literature from the earliest texts to the present day. Prerequisite, reading knowledge of German. Two weekly lectures will aim at a characterization of the temper of a period or of the essential nature of a certain writer. A discussion period will concentrate on individual works illustrative of the topics of the lecture. Hours to be arranged. Mr. Blackall.

LITERARY SOURCES IN THE ITALIAN RENAISSANCE

(History of Art 446)

Spring term. Credit four hours. Mr. Selig.

[MODERN DRAMATISTS]

(German 412)

Spring term. Credit four hours. M W F 10:10. Mr. Connor. Not offered in 1969-70.

[MODERN GERMAN LITERATURE]

(German 411)

Fall term. Credit four hours. M W F 11:15. Mr. Deinert. Not offered in 1969-70.

501-502. TOPICS IN MODERN LITERATURE

Throughout the year. Credit four hours a term. Primarily for graduate students in Comparative Literature. Prerequisite, reading knowledge of French or German. Fall term: W 1:25-3:20, Mr. Gelley. Spring term: T 2:30-4:25.

Fall term: trends in twentieth-century criticism. Topics will include theoretical problems related to criticism (such as periodization and biographical evidence), specific movements or orientations (Geistesgeschichte, Phenomenology, stylistics), and questions of genre (some recent definitions of the novel). Spring term: An examination of landmark prose works of the twentieth century by Mann, Rilke, Musil, Gide, Sarraute, and Dos Passos, and an attempt to see them in the light of modern criticism.

[520. EIGHTEENTH-CENTURY AESTHETICS]

Spring term. Credit four hours. T 2:30-4:25. Mr. Dieckmann. Not offered in 1969-70.

TEXTUAL CRITICISM AND LITERARY INTERPRETATION

(Society for the Humanities 505-506)

Throughout the year. Credit four hours a term. Open, by invitation, to seniors and graduate students. Mr. Dieckmann.

639-640. SPECIAL TOPICS IN MEDIEVAL STUDIES

Throughout the year. Credit four hours. Hours to be arranged.

COMPUTER SCIENCE

Colleges of Arts and Sciences and Engineering

Mr. J. Hartmanis, Chairman; Messrs. K. M. Brown, R. L. Constable, R. W. Conway, J. E. Hopcroft, W. L. Maxwell, H. L. Morgan, C. Pottle, G. Salton, A. C. Shaw, R. Sweet, R. A. Wagner, R. J. Walker, and P. Wegner.

Computer science is a relatively new field of study that draws on and contributes to a number of existing disciplines such as mathematics, engineering, linguistics, and psychology, among others. Developments in this field are also used to make important contributions in research, development, design, and management activities in the various functional areas of engineering and applied science.

At Cornell, computer science is concerned with fundamental knowledge in automata, computability, and programming languages and

systems programming, as well as with subjects such as numerical analysis and information processing which underlie broad areas of computer applications. Because of the wide implications of research in the field, the Department of Computer Science is organized as an intercollege department in the College of Arts and Sciences and the College of Engineering.

Even though there is as yet no formal undergraduate major in computer science, the Department offers a comprehensive set of undergraduate and graduate courses from which students can select the appropriate sequences to fit their major interests. For example, the student who is interested in the mathematical aspects of computer science can major in mathematics and choose mathematics Option I or Option II, including Computer Science 421-422 (Numerical Analysis) and then select fifteen or more hours of computer science courses.

The students at Cornell are urged to take as many computer science courses as possible to acquaint themselves with this new science and prepare themselves to use it in their fields of study. Members of the Department are available to discuss with students the appropriate courses for their levels of ability and interest.

201. SURVEY OF COMPUTER SCIENCE

Fall term. Credit three hours. M W F 9:05.

Introduction to the structure and use of the modern computer. This course is intended to be a nonmathematical treatment of the material, and emphasis is on nonnumeric computer applications such as information retrieval, language processing, and artificial intelligence. A limited introduction to programming in a problem-oriented language is included.

202. COMPUTERS AND PROGRAMMING

Spring term. Credit three hours. Prerequisites, 201 or 311 or the equivalent. M W F 9:05.

This course is an introduction to computer programming and machine organization. It is concerned with the concept and properties of algorithms, programming in a procedure-oriented language, application to numeric and nonnumeric problems. Program structure, data representation, computing systems, debugging techniques. Computer structure, instruction formats and types, and machine language programming.

203. DISCRETE STRUCTURES

Fall term. Credit three hours. Prerequisite, 201 or 202. M W F 1:25.

This course deals with fundamental mathematical concepts relevant to computer science. Set algebra, mappings, relations, partial ordering, equivalence relations, congruences. Operations on a set, groups, semigroups, rings and lattices, isomorphism and homomorphism, applications to automata and formal languages. Boolean algebra, applications to switching theory and decision tables. Directed and undirected graphs, subgraphs, chains, circuits, paths, cycles, graph isomorphism, application to syntactic analysis and computer program analysis.

222. NUMERICAL CALCULUS

Spring term. Credit three hours. Prerequisite, 202. M W F 1:25.

This course considers the basic techniques of numerical analysis and includes the solution of some numerical problems on the computer. Truncation and

round-off errors, solution of nonlinear equations, interpolation, finite difference calculus, numerical differentiation and integration. Solution of linear systems of equations. Least squares approximation. Numerical solution of ordinary differential equations.

311. INTRODUCTION TO COMPUTER PROGRAMMING

Either term. Credit two hours. T Th 11:15.

Notations for describing algorithms, analysis of computational problems. Application of the (FORTRAN IV, PL/I) programming language to solve simple numerical and nonnumerical problems using a digital computer.

385. INTRODUCTION TO AUTOMATA THEORY

Spring term. Credit three hours. Prerequisites, 203 or Mathematics 222 or 294. M W F 10:10.

This course is concerned with models of abstract computing devices. Finite automata and regular expressions and sets. Input-output experiments, non-deterministic machines, parallel and sequential realizations, and algebraic structure theory. Pushdown automata and context-free languages. Closure properties and decision problems. Turing machines and recursively enumerable sets. Universal Turing machines, the halting problem, decidability.

401. COMPUTER ORGANIZATION AND PROGRAMMING

Either term. Credit four hours. Prerequisite, Mathematics 221 or 293 or the equivalent. T Th 11:15. Laboratory, M T W Th or F 2:30-4:25.

Characteristics and structure of digital computers. Programming in assembly and higher-order languages. Representation of data, index registers and indirect addressing, program organization, macro operations, recursive procedures, interpretive routines, auxiliary storage and input-output, operating systems.

404. ADVANCED COMPUTER PROGRAMMING

Spring term. Credit four hours. Prerequisite, 401 or consent of the instructor. T Th 1:25, F 2:30.

This course is intended for students who wish to learn computer programming for eventual use in professional systems programming or advanced applications. To develop this ability, the basic logical and physical structure of digital computers is considered and the applicability and limitations of this structure is studied through many examples and exercises. The approach, therefore, is not a theoretical one, but rather an engineering one, in which techniques are emphasized. The students are expected to participate in a large systems programming design and implementation effort.

409. DATA STRUCTURES

Fall term. Credit four hours. Prerequisites, 202 or 401 or the equivalent. T Th 9:05, W 2:30.

This course is concerned with data structures, relations between data elements, and operations upon data structures. Bits, bytes, fields, arrays, stacks, trees, graphs, lists, strings, records, files and other forms of data structures. Primitive operations, accessing techniques, and storage management techniques appropriate to each class of data structures. Sorting and searching techniques, symbol table structures. Data structures in programming languages, retrieval systems and data management systems. Formal specification of classes of information structures.

411. PROGRAMMING LANGUAGES AND COMPILERS

Fall term. Credit four hours. Prerequisite, 202 or 401 or consent of the instructor. M W F 1:25.

This course is an introduction to the structure of programming languages. Specification of syntax and semantics. Properties of algorithmic, list processing, string manipulation, and simulation languages: basic data types and structures, operations on data, statement types, and program structure. Macro languages and their implementation. Run-time representation of programs and data. Storage management techniques. Introduction to compiler construction.

412. TRANSLATOR WRITING

Spring term. Credit four hours. Prerequisites, 409 and 411, or consent of the instructor. M W F 1:25.

This course discusses the models and techniques used in the design and implementation of assemblers, interpreters, and compilers. Topics include: lexical analysis in translators, compilation of arithmetic expressions and simple statements. Specification of syntax. Algorithms for syntactic analysis. Code generation and optimization techniques. Bootstrapping methods. Compiler-compiler systems.

413. SYSTEMS PROGRAMMING AND OPERATING SYSTEMS

Fall term. Credit four hours. Prerequisite, 409 or consent of the instructor. M W F 1:25.

This course is concerned with the organization and software components of modern operating systems. Batch processing systems. Loaders, input-output systems and interrupt handling. Descriptive schema for parallel processes; communication among parallel processes. Introduction to multiprogramming and multiprocessing systems. Addressing techniques, memory and instruction protection, procedure and data sharing; process scheduling, resource management; file organization, accessing, and management. Time-sharing systems. Case studies in multiprogramming, multiprocessing, and time-sharing. Additional topics such as job control languages and microprogramming. Projects involving the design and implementation of systems program modules.

415. MACHINE ORGANIZATION

Spring term. Credit four hours. Prerequisite, 202, 401, or consent of the instructor. M W F 2:30.

This course is concerned with the design and functional organization of digital computers. Boolean algebra, elements of logical design and computer components. Counters, shift registers, half and full adders, design of arithmetic units. Memory components, accessing and retrieval techniques, addressing structures, realization of indexing and indirect addressing. Control unit structure, instruction decoding, synchronous and asynchronous control. Input-output channels, buffering, auxiliary memory structure, interrupt structures. Overall system organization, reliability, system diagnostics, system simulation.

420. COMPUTER APPLICATIONS OF NUMERICAL ANALYSIS

Fall term. Credit four hours. Prerequisites, Mathematics 222 or 294 and Computer Science 311 or equivalent programming experience. M W F 10:10.

Modern computational algorithms for the numerical solution of a variety of applied mathematics problems are presented and students solve current representative problems by programming each of these algorithms to be run on the computer. Topics include numerical algorithms for the solution of linear systems; finding determinants, inverses, eigenvalues and eigenvectors of matrices; solution of a single polynomial or transcendental equation in one

unknown; solution of systems of nonlinear equations; acceleration of convergence; Lagrangian interpolation and least squares approximation for functions given by a discrete data set; differentiation and integration; solution of ordinary differential equations: initial value problems for systems of nonlinear first order differential equations, two-point boundary value problems; partial differential equations: finite difference grid technique for the solution of the Poisson equation.

421-422. NUMERICAL ANALYSIS

Throughout the year. Credit four hours a term. Prerequisite, Mathematics 412 or 416 or 422 or consent of the instructor. M W F 9:05.

A mathematically rigorous treatment of numerical analysis. Covers the topics of Computer Science 420 in a more complete fashion with emphasis on careful analytical derivation of algorithms, proofs of convergence and error analysis. Includes some computer programming projects.

435. INFORMATION ORGANIZATION AND RETRIEVAL

Spring term. Credit four hours. Prerequisite, 401 or the equivalent. T Th 9:05, occasionally W 2:30.

Covers all aspects of automatic language processing on digital computers, with emphasis on applications to information retrieval. Analysis of information content by statistical, syntactic and logical methods. Dictionary techniques. Automatic retrieval systems, question-answering systems. Evaluation of retrieval effectiveness.

[441. HUERISTIC PROGRAMMING]

Spring term. Credit four hours. Prerequisites, 401 and 411. Not offered in 1969-70.

485. THEORY OF AUTOMATA I

Fall term. Credit four hours. Prerequisite, 203 or 401 or consent of the instructor. M W F 11:15.

Automata theory is the study of abstract computing devices; their classification, structure and computational power. Topics include finite state automata, regular expressions, decomposition of finite automata and their realization, Turing machines and their computational power.

486. THEORY OF AUTOMATA II

Spring term. Credit four hours. Prerequisite, 485 or consent of the instructor. M W F 11:15.

Topics include context-free and context-sensitive languages and their relation to push-down and linearly bounded automata. Quantitative aspects of Turing machine computations: time and memory bounded computations with applications to language processing and classification of other automata and computations.

487. FORMAL LANGUAGES

Fall term. Credit four hours. Prerequisite, 486 or consent of the instructor. M W F 2:30.

A study of formal languages, their processing and processors. Topics include regular, context-free, and context-sensitive languages; their recognition, parsing, algebraic properties, decision problems, recognition devices, and applications to computer and natural languages.

488. THEORY OF EFFECTIVE COMPUTABILITY

Spring term. Credit four hours. Prerequisite, 401, 485, Mathematics 481 or consent of the instructor. T Th 10:10.

Turing machines and Church's Thesis, universal Turing machines, unsolvability of the halting problem. Recursively enumerable sets, productive and creative sets, relative computability, the recursion theorem, Post's problem. Computational complexity hierarchies.

521. NUMERICAL ANALYSIS OF LINEAR AND NONLINEAR SYSTEMS OF EQUATIONS

Spring term. Credit four hours. Prerequisite, 422 or consent of the instructor. M W F 9:05.

Topics include recent methods for the solution of linear systems and eigenvalue, eigenvector determination; global convergence theorems for nonlinear systems, Newton-Kantorovich theory and its variations; function minimization.

523. NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS AND INTEGRAL EQUATIONS

Fall term. Credit four hours. Prerequisite, 422 or consent of the instructor. M W F 11:15.

Topics include solution of n th order nonlinear initial value problems and boundary value problems; single step methods; predictor-corrector techniques; stability, accuracy and precision of methods; eigenvalue problems; solution of integral equations having constant or variable limits; finite difference and iterative methods; singular and nonlinear integral equations.

525. NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS

Spring term. Credit four hours. Prerequisite, 523 or consent of the instructor. M W F 11:15.

General classification; solution by method of characteristics; finite-difference methods for hyperbolic and elliptic equations; parabolic equations in two dimensions; direct solution of elliptic finite-difference equations; iterative methods for the solution of elliptic equations; block methods for large systems; singularities in elliptic equations; stability in relation to initial value problems and nonlinear discretization algorithms.

[527. NUMERICAL METHODS IN APPROXIMATION THEORY]

Spring term. Credit four hours. Prerequisite, 422 or consent of the instructor. M W F 9:05. Not offered in 1969-70.

587. COMPUTATIONAL COMPLEXITY

Fall term. Credit four hours. Prerequisite, 486 or 488 or consent of the instructor. T Th 9:05.

General measures of computational complexity and methods of classifying computable (recursive) functions. Examples of topics include restricted Turing machines, time and memory bounded computations as well as quantitative results about formal languages.

590. SPECIAL INVESTIGATIONS IN COMPUTER SCIENCE

Throughout the year. Credit to be arranged. Prerequisite, consent of the registration officer of the Department. Hours to be arranged.

Offered to qualified students individually or in small groups. Directed study of special problems in the field of computer science.

591. COMPUTER SCIENCE GRADUATE SEMINAR

Throughout the year. Credit one hour. For graduate students interested in computer science. Th 4:30-6. Staff, visitors, and students.

A weekly meeting for the discussion and study of important topics in the field.

611. SEMINAR IN PROGRAMMING

Spring term. Credit four hours. Prerequisite, 411 or consent of the instructor.

621. SEMINAR IN NUMERICAL ANALYSIS

Either term. Credit four hours. Prerequisite, consent of the instructor.

635. SEMINAR IN INFORMATION ORGANIZATION AND RETRIEVAL

Fall term. Credit four hours. Prerequisite, Computer Science 435.

681. SEMINAR IN AUTOMATA THEORY

Either term. Credit four hours. Prerequisite, 486 or consent of the instructor.

DIGITAL SYSTEMS SIMULATION

(Industrial Engineering 9580)

Fall term. Credit three hours. Prerequisites, Computer Science 401 and Operations Research 9470, or consent of the instructor.

DATA PROCESSING SYSTEMS

(Industrial Engineering 9583)

Fall term. Credit three hours. Prerequisite, Computer Science 401 or consent of the instructor.

SWITCHING SYSTEMS I

(Electrical Engineering 4487)

Fall term. Credit three hours. Prerequisite, Electrical Engineering 4322 or consent of the instructor.

SWITCHING SYSTEMS II

(Electrical Engineering 4488)

Spring term. Credit three hours. Prerequisite, Electrical Engineering 4487 or the equivalent.

ECONOMICS

Mr. T. E. Davis, Chairman; Messrs. G. P. Adams, Jr., G. Bickel, W. V. Bussmann, N. R. Chen, M. G. Clark, M. G. de Chazeau, D. F. Dowd, W. D. Evans, H. Fleisig, W. Galenson, F. H. Golay, G. H. Hildebrand, P. M. Hohenberg, J. G. B. Hutchins, A. E. Kahn, R. W. Kilpatrick, J. H. Levin, T. C. Liu, W. F. Long, C. Morse, D. Mueller, R. T. Selden, G. J. Staller, J. Vanek, G. M. von Furstenberg.

Students wishing to major in economics must have completed both Economics 101 and Economics 102, or their equivalents, and, moreover, must have averaged at least C in these courses. Students who have completed only Economics 101 may be provisionally accepted as majors, but only if they have obtained a grade of B- or better. Freshmen in-

tending to major in economics are advised to begin the course sequence, Economics 101-102, no later than their second term in residence. The distribution requirements should be completed by the end of the sophomore year. Prospective majors are advised to consider as possible electives Principles of Accounting (Business and Public Administration 112S), Introductory Statistics (Agricultural Economics 314), and courses in calculus. These courses will contribute materially to preparation for advanced work in economics. Students proposing to major in economics should report to the secretary of the Department of Economics with a transcript of courses.

To complete the major, twenty-eight hours of economics courses in addition to Economics 101-102 must be completed, including Economics 311 and 312. Industrial and Labor Relations 241 and 445 and Business and Public Administration 375, 575, and 576 may be included. In addition, majors in economics are expected to complete a minimum of three advanced courses in subjects related to economics, selected with the approval of their major advisers, from the offerings in the Departments of American Studies, Anthropology, Asian Studies, Government, History, Mathematics, Philosophy, (Social) Psychology, and Sociology. Prospective majors should, therefore, anticipate any prerequisites these advanced courses may require, and complete them in their freshman and sophomore years. Programs of related subjects should complement programs of courses in economics, and both must be arranged in consultation with advisers.

THE HONORS PROGRAM. Candidates for the degree of Bachelor of Arts with Honors in Economics will enroll in the Honors seminar. Honors candidates are expected to complete thirty-two hours of advanced courses in economics, including the Honors seminar, and all courses required of majors.

Students seeking admission to the Honors seminar should consult their advisers not later than November 1 of their junior year. Application will not normally be considered from students whose cumulative average is less than B- in both their general studies and their courses in economics.

A comprehensive Honors examination, both written and oral, will be given to Honors candidates at the end of their senior year. Honors candidates may be exempted from final examinations in their other courses in economics at the end of their senior year.

DISTRIBUTION REQUIREMENT. The Distribution requirement in social sciences is satisfied in economics by Economics 101-102.

I. Introductory Courses

101. MODERN ECONOMIC SOCIETY

Either term. Credit three hours. Large lectures, plus two additional discussion sections scheduled throughout the week. Fall term: M W 9:05, T Th 9:05, 11:15. Messrs. Galenson, Fleisig, Staller, and assistants. Spring term: T Th 9:05. Mr. Dowd and assistants. Honors sections, hours to be arranged. Staff.

Centers on the determinants of aggregate economic activity. The main areas studied are the monetary and banking systems, the composition and fluctuations of national income, and the major conditions of economic growth, all as influenced by monetary, fiscal, and other policies.

102. MODERN ECONOMIC SOCIETY

Either term. Credit three hours. Large lectures, plus two additional discussion sections scheduled throughout the week. Fall term: M W 9:05. Mr. Adams and assistants. Spring term: M W 9:05, 11:15, T Th 11:15. Messrs. Bickel, Hohenberg, Morse and assistants.

A survey of the existing economic order, with particular emphasis on the salient characteristics of the modern American economy. Concentration is on explaining and evaluating the operation of the price system as it regulates production, distribution, and consumption, and as it is in turn modified and influenced by private organization and government policy.

II. Advanced Undergraduate Courses

A. GENERAL

300. MAJOR SEMINARS

Either term. Credit four hours. Hours to be arranged. Fall term: Mr. Levin. Spring term: Mr. von Furstenberg.

Seminars limited to fifteen students. Seminars will be offered in selected topics. Majors will be given preference with respect to assignment to particular seminars. Titles and principal topics will appear in the *Supplementary Announcement*.

311. INTERMEDIATE MICROECONOMIC THEORY

Either term. Credit four hours. Required of all students majoring in economics. Prerequisite 101-102 or consent of the instructor. Fall term: M W F 9:05, 10:10, T Th S 11:15. Messrs. Long, Morse and others. Spring term: T Th S 10:10. Staff.

Analysis of the pricing processes in a private enterprise economy under varying competitive conditions, their role in the allocation of resources, and the functional distribution of national income.

312. INTERMEDIATE MACROECONOMIC ANALYSIS

Either term. Credit four hours. Required of all students majoring in economics. Prerequisite, Economics 101-102 or consent of the instructor. Fall term: T Th S 11:15. Mr. von Furstenberg. Spring term: M W F 9:05, 11:15, T Th S 10:10. Staff.

An introduction to the theory of national income determination and economic growth in alternative models of the national economy; the interaction and relation of aspects of these models to empirical aggregate economic analysis.

315. HISTORY OF ECONOMIC THOUGHT

Fall term. Credit four hours. W 2:30-4:20. Mr. Adams.

A survey of the development of economic ideas from the early modern period to the twentieth century. Extensive readings from the Mercantilists, Smith, Ricardo, Mill, and Marshall, with class discussion of these.

[316. HISTORY OF ECONOMIC THOUGHT]

Not offered in 1969-70.

317. INTERMEDIATE MATHEMATICAL ECONOMICS I

Fall term. Credit four hours. Prerequisite, Economics 101 and 102 or the equivalent. M W 1:25-2:40. Mr. Evans.

No prior acquaintance with the mathematical topics covered is required. Discussion of economic subjects will include: economic models; static or equilibrium analysis; comparative-static analysis; optimization of objective functions subject to constraints; production functions. Mathematical topics discussed will include: functional dependence; set theory; linear models and matrix algebra; derivatives and differentiation; partial derivatives; differentials; tests for extreme values; maxima and minima subjects to constraints; homogeneous functions.

318. INTERMEDIATE MATHEMATICAL ECONOMICS II

Spring term. Credit four hours. Prerequisite, Economics 317 or a course in the differential calculus. M W 1:25-2:40. Mr. Evans.

Economic subjects discussed will include: Domar and Solow growth models; the Domar debt model; cobweb models; the Samuelson multiplier-accelerator model; dynamic input-output models; linear programming models and their duals. Mathematical topics discussed will include: integration; differential equations; difference equations; simultaneous equation models; linear programming; game theory.

319-320. QUANTITATIVE METHODS IN ECONOMICS

Throughout the year. Credit four hours a term. Prerequisite, I & LR 210 (School of Industrial and Labor Relations) or Agricultural Economics 314 (College of Agriculture) or consent of the instructor. Fall term: T Th S 11:15. Spring term: T Th S 11:15. Mr. Bussmann.

Application of elementary statistical techniques to economic analysis.

B. ECONOMIC HISTORY

[321. ECONOMIC HISTORY OF ANCIENT MEDIEVAL EUROPE]

Fall term. Credit four hours. Open to upperclassmen with some background in economics or history, or with consent of the instructor. M W F 10:10. Mr. Dowd. Offered in alternate years. Not offered in 1969-70.

An examination and analysis of significant processes and relationships in the economic development of Europe in the ancient and medieval periods. Attention will be given to reciprocal relationships between the social and political context and the behavior of the economy over time.

322. ECONOMIC HISTORY OF MODERN EUROPE

Spring term. Credit four hours. Prerequisite, same as for 321. M W F 10:10. Mr. Hohenberg.

The period covered is from the mid-eighteenth century to the present.

[323. AMERICAN ECONOMIC HISTORY]

Fall term. Credit four hours. Prerequisites, Economics 101-102, or consent of the instructor. T Th S 10:10. Mr. Fleisig. Offered in alternate years. Not offered in 1969-70.

The course will concentrate on three lines of investigation: the use of economic and statistical analysis as an aid in answering historical questions,

the use of historical experience in determining the validity of aspects of economic theory, and the extent to which historical economic experience is useful in resolving current economic problems. Problems selected from the period 1800-1900 will be discussed.

324. AMERICAN ECONOMIC HISTORY

Spring term. Credit four hours. Prerequisites, same as for 323. T Th S 10:10. Mr. Fleisig.

Continuation of 323. Problems selected from the period 1900-1939 will be discussed.

325. ECONOMIC HISTORY OF LATIN AMERICA

Fall term. Credit four hours. Open to upperclassmen with some background in economics or history, or with consent of the instructor. M W F 10:10. Mr. Davis.

A survey emphasizing the processes and problems of economic growth and the evolution of economic institutions.

327. THE ENVIRONMENT OF ECONOMIC ACTIVITY IN POSTWAR EUROPE

Fall term. Credit four hours. Prerequisite, Economics 101-102 or the equivalent. M W F 9:05. Mr. Hohenberg.

Economic growth and change in postwar Europe, with special emphasis on the business system and the role of the state. Topics taken up will include the sources of economic growth, the role of management, labor, and consumers, planning versus competition, integration and trade liberalization, the impact of the U.S. and regional development. Concentration on Western Europe.

329. ECONOMIC HISTORY OF EARLY MODERN EUROPE

Fall term. Credit four hours. Prerequisite, open to upperclassmen with some background in economics or history, or with consent of the instructor. M W F 10:10. Mr. Dowd.

An examination and analysis of the major processes of economic and social change in the post-Medieval, preindustrial period.

ECONOMIC AND BUSINESS HISTORY

(Business and Public Administration 375, Graduate School of Business and Public Administration)

Fall term. Credit three hours. Limited to seniors who have completed Economics 101-102. M W F 9:05. Mr. Hutchins.

C. MONEY, BANKING, AND PUBLIC FINANCE

331. THE ECONOMICS OF MONEY AND CREDIT

Fall term. Credit four hours. Prerequisite, Economics 101-102. T Th S 10:10. Mr. Kilpatrick.

A systematic treatment of the determinants of the money supply and the volume of credit. Economic analysis of credit markets and financial institutions in the United States.

335. PUBLIC FINANCE: RESOURCE ALLOCATION

Fall term. Credit four hours. Prerequisite, Economics 101-102. T Th S 9:05. Mr. von Furstenberg.

An analysis of the role of government in allocating resources through taxes and expenditures. Criteria for evaluation will be developed and applied to specific policies. Attention will focus on the federal government.

338. MACROECONOMIC POLICY

Spring term. Credit four hours. Prerequisite, Economics 312. T Th S 9:05. Mr. Kilpatrick.

A study of the use of fiscal and monetary policies for achieving economic stability and growth.

D. LABOR ECONOMICS

ECONOMICS OF WAGES AND EMPLOYMENT

(Industrial and Labor Relations 241, School of Industrial and Labor Relations)

Spring term. Credit three hours. Prerequisite, Economics 101-102. Mr. Hildebrand and others.

342. ECONOMICS AND PROBLEMS OF LABOR

Spring term. Credit four hours. Prerequisite, Economics 101-102. I&LR 241 (School of Industrial and Labor Relations) recommended. T Th 1:25-2:40. Mr. Hildebrand.

An advanced course concerning the institutional organization of labor markets, economic analysis of their operation, and major policy questions involved. Principal topics include wage and employment theory, determinants of wage level and structure, technological change, unemployment, poverty and income distribution, inflation and income policy.

(Formerly Economics 442)

E. ORGANIZATION, PERFORMANCE, AND CONTROL OF INDUSTRY

351. INDUSTRIAL ORGANIZATION

Fall term. Credit four hours. Prerequisite, Economics 101-102. M W F 9:05. Mr. Mueller.

An analysis and approach of the prevalence and effectiveness of competition in the American economy centering on the structure, conduct and performance of American industry. Structural characteristics to be discussed include concentration, economies of scale, product differentiation and barriers to entry. Among the numerous aspects of business behavior to be examined will be merger decisions, pricing, advertising, and technological innovation policies. A number of case studies of American industries and firms will be read, and emphasis will be placed on relating the theories of monopoly, oligopoly and competition to the histories of specific firms and industries.

352. PUBLIC REGULATION OF BUSINESS

Spring term. Credit four hours. Prerequisite, Economics 351 or consent of the instructor. M W F 9:05. Mr. Long.

A continuation of Economics 351, concentrating mainly on public policies of enforcing, supplementing, or replacing competition, with specific studies of selected industries and recent legal cases.

354. ECONOMICS OF REGULATION

Spring term. Credit four hours. M W F 9:05. Mr. Kahn.

A study of the economics of direct regulation of industry. The course will

concentrate on the traditional public utility industries (electricity, gas, communications, and transportation) and will draw on regulatory experience in competitive industries where relevant. Concentration will be on the application of economic principles to common problems of regulation with equal emphasis on institutional problems—the characteristics and problems of the regulatory process itself, the proper role and definition of competition—and recognition throughout of the necessity for reconciling economic and non-economic goals. Among topics covered: the proper rate level; principles of rate structure—marginal cost pricing, peak responsibility pricing, and price determination; rate making in competitive situations; limitations on entry, and independent price making; regulation of quality of services; integration of public utility companies and systems; public enterprise; the accommodation to technological change.

(Formerly Economics 353)

TRANSPORTATION: RATES AND REGULATIONS

(Business and Public Administration 575, Graduate School of Business and Public Administration)

Fall term. Credit three hours. Limited to seniors who have taken Economics 101–102 or the equivalent. M W F 10:10. Mr. Hutchins.

TRANSPORTATION: ORGANIZATION, ADMINISTRATION, AND PUBLIC POLICIES

(Business and Public Administration 576, Graduate School of Business and Public Administration)

Spring term. Credit three hours. Limited to seniors who have completed Economics 101–102. M W F 10:10. Mr. Hutchins.

F. INTERNATIONAL AND COMPARATIVE ECONOMICS

361. INTERNATIONAL TRADE THEORY AND POLICY

Fall term. Credit four hours. Prerequisite, Economics 101–102 or consent of the instructor. M W F 11:15. Mr. Levin.

Survey of the principles that have served as guides in the formulation of international trade and commercial policies. The evolution of the theory of international trade, principles and practices of commercial policy, problems of regional integration and customs unions, and institutions and practices of state trading will be emphasized.

362. INTERNATIONAL MONETARY THEORY AND POLICY

Spring term. Credit four hours. Prerequisite, Economics 101–102 or consent of the instructor. M W F 11:15. Mr. Levin.

Survey of the principles that have served as guides in the formulation of international financial policies. The evolution of the theory of balance of payments adjustment, international monetary standards, the nature of conflicts arising out of the relationship between domestic economic policies and external economic relations, international capital movements, economic aid, international monetary institutions, and proposals for international monetary reforms will be emphasized.

[364. THE UNITED STATES IN THE WORLD ECONOMY]

Spring term. Credit four hours. Prerequisites, Economics 101–102 or consent of the instructor. M W F 9:05. Mr. Golay. Not offered in 1969–70.

[365. ECONOMIC POLICY AND DEVELOPMENT IN SOUTHEAST ASIA]

Fall term. Credit four hours. Prerequisite, consent of the instructor. M W F 9:05. Mr. Golay. Not offered 1969-70.

367. COMPARATIVE ECONOMIC SYSTEMS: SOVIET UNION AND EUROPE

Fall term. Credit four hours. Prerequisites, Economics 101-102 and I&LR 445 (School of Industrial and Labor Relations) or consent of the instructor. M W F 10:10. Mr. Staller.

Discussion of the rationality and feasibility of economic planning (von Mises, Hayek, Lange). Examination of the various approaches to planning, including the discussion of the planning techniques in France, Yugoslavia, and the Soviet Union (with emphasis on the last country). Comparison of economic performance of various free and planned economies. Consideration of economic competition between the free and the planned systems.

[369. INTRODUCTION TO THE ECONOMY OF CHINA]

Fall term. Credit four hours. Prerequisite, consent of the instructor. T Th S 9:05. Mr. Chen. Not offered in 1969-70.

A survey of modern Chinese economic development with special emphasis on the policies, performance, and problems of the mainland economy since 1949.

COMPARATIVE ECONOMIC SYSTEMS: SOVIET RUSSIA

(Industrial and Labor Relations 445, School of Industrial and Labor Relations) Spring term. Credit four hours. Prerequisite, Economics 101-102 or consent of the instructor. T Th 2-3:30. Mr. Clark.

G. ECONOMIC GROWTH AND DEVELOPMENT

371. PUBLIC POLICY AND ECONOMIC DEVELOPMENT

Fall term. Credit four hours. Prerequisite, Economics 101-102 or consent of the instructor. M W F 9:05. Mr. Morse.

Study of the role of the state in initiating and maintaining accelerated economic growth in less developed countries. Problems of capital accumulation, agricultural development, management of monetary and external disequilibria, interaction of culture change and economic growth, outside participation in economic modernization, and the role of international specialization are emphasized.

372. PROCESSES OF ECONOMIC GROWTH AND DEVELOPMENT

Spring term. Credit four hours. Prerequisite, Economics 101-102 or consent of the instructor. Nonmajors and students who have not completed the prerequisite should see Center for International Studies 372. T Th S 9:05. Mr. Bickel.

A consideration of various contributions by economists and others to an understanding of how societies undergo economic growth and institutional change. Developing countries are the main focus of attention, most detailed consideration being given to Africa. Some possibilities of combining elements from economics and other fields to form a broad approach to economic development are explored.

373-374. ECONOMIC DEVELOPMENT OF THE URBAN GHETTO

Throughout the year. Credit four hours a term. Prerequisite, consent of the

instructor. First term not prerequisite to the second. Hours to be arranged. Fall term: Mr. Bickel. Spring term: Mr. Dowd.

An exploration of the requisite conditions (particularly resource endowments) for developing sources of economic strength in the urban ghetto. Elements of the theory of economic development, industrial organization, public finance and urban economics, plus relevant political and sociological relationships will be employed to analyze change in a particular urban ghetto. Basic concepts and empirical data relating to cartelization, discrimination, and the economic value of education will be employed extensively.

H. HONORS PROGRAM

390. HONORS SEMINAR

Spring term. Credit four hours. Required of all juniors who plan to be candidates for Honors. W 2:30-4:20. Mr. Adams.

Readings in books which have been significant in the development of economics.

391-392. HONORS SEMINAR

Throughout the year. Credit four hours a term. Required of all seniors who are candidates for Honors. M 2:30-4:20. Messrs. Hildebrand and Adams and staff.

Continuation of Economics 390, together with the writing of an Honors thesis and preparation for the comprehensive Honors examinations.

399. READINGS IN ECONOMICS

Either term. Credit two hours a term. Staff.

Graduate Courses and Seminars

For complete descriptions of graduate courses see the *Announcement of the Graduate School: Social Sciences*.

511. PRICE AND ALLOCATION THEORY

Either term. Credit four hours a term. Prerequisite, consent of the instructor. Throughout the year. M W F 11:15. Mr. Mueller.

512. MACROECONOMIC THEORY

Either term. Fall term: T Th S 9:05. Mr. Bickel. Spring term: T Th S 10:10. Mr. Kilpatrick.

517-518. INTERMEDIATE MATHEMATICAL ECONOMICS I AND II

Throughout the year. Credit four hours a term. M W 1:25-2:40. Mr. Evans.

519-520. QUANTITATIVE METHODS

Either term. Credit four hours a term. M W F 11:15. Mr. Long.

521-522. EUROPEAN ECONOMIC HISTORY

Throughout the year. Credit four hours a term. M W F 10:10. (Not offered in fall term). Spring term. Mr. Hohenberg.

[523. AMERICAN ECONOMIC HISTORY]

Fall term. Credit four hours. Mr. Fleisig. Not offered in 1969-70.

120 ECONOMICS

525. ECONOMIC HISTORY OF LATIN AMERICA

Fall term. Credit four hours. M W F 10:10. Mr. Davis.

527. THE ENVIRONMENT OF ECONOMIC ACTIVITY IN POSTWAR EUROPE

Fall term. Credit four hours. M W F 9:05. Mr. Hohenberg.

529. ECONOMIC HISTORY OF EARLY MODERN EUROPE

Fall term. Credit four hours. M W F 10:10. Mr. Dowd.

561-562. INTERNATIONAL ECONOMIC THEORY AND POLICY

Throughout the year. Credit four hours a term. M W F 11:15. Mr. Levin.

565. ECONOMIC PROBLEMS OF LATIN AMERICA

Spring term. Credit four hours. Hours to be arranged. Mr. Davis.

571-572. ECONOMIC GROWTH AND DEVELOPMENT

Throughout the year. Credit four hours a term. Fall term: M W F 9:05. Mr. Morse. Spring term: T Th S 9:05. Mr. Bickel.

611. ADVANCED MICROECONOMIC THEORY

Fall term. Hours to be arranged. Staff.

612. ADVANCED MACROECONOMIC THEORY

Spring term. Hours to be arranged. Mr. Vanek.

613-614. HISTORY OF ECONOMIC THOUGHT

Throughout the year. (Offered only in fall term in 1969-70). W 2:30-4:20. Mr. Adams.

617-618. MATHEMATICAL ECONOMICS

Throughout the year. Hours to be arranged. Staff.

619-620. ECONOMETRICS

Throughout the year. Hours to be arranged. Mr. Bussmann.

SEMINAR IN ECONOMIC STATISTICS

(Industrial and Labor Relations 610, School of Industrial and Labor Relations)

Fall term. Mr. Evans.

621-622. SEMINAR IN ECONOMIC HISTORY

Throughout the year. Hours to be arranged. Messrs. Dowd, Fleisig, and Hohenberg.

[623. AMERICAN ECONOMIC HISTORY]

Not offered in 1969-70.

624. AMERICAN ECONOMIC HISTORY

Spring term. Hours to be arranged. Mr. Fleisig.

[625. SELECTED PROBLEMS IN THE HISTORY OF THE INTERNATIONAL ECONOMY 1800-1939]

Spring term. Mr. Fleisig. Not offered in 1969-70.

631-632. MONETARY THEORY AND POLICY

Throughout the year. Hours to be arranged. Mr. Selden.

635-636. PUBLIC FINANCE: RESOURCE ALLOCATION AND FISCAL POLICY

Throughout the year. Messrs. Kilpatrick and von Furstenberg.

641-642. LABOR ECONOMICS

Throughout the year. Mr. Galenson.

651-652. INDUSTRIAL ORGANIZATION AND REGULATION

Throughout the year. Fall term: Mr. Kahn. Spring term: Mr. Mueller.

661-662. INTERNATIONAL ECONOMICS: PURE THEORY AND POLICY

Throughout the year. Mr. Vanek.

[663-664. INTERNATIONAL ECONOMICS: BALANCE OF PAYMENTS AND INTERNATIONAL FINANCE]

Not offered in 1969-70.

666. SPECIAL TOPICS IN INTERNATIONAL FINANCE

Spring term. Credit four hours. Hours to be arranged. Mr. Levin.

669. SEMINAR ON INDONESIAN ECONOMY: CHANGE AND GROWTH

Spring term. Credit four hours. No prerequisite. Hours to be arranged. Mr. Arndt.

671-672. ECONOMICS OF DEVELOPMENT

Throughout the year. Fall term: Staff. Spring term: Mr. Morse.

[673. THEORY AND PRACTICE OF DECENTRALIZED SOCIALIST SYSTEMS]

Fall term. Credit four hours. Prerequisite, Economics 311 and 312 or consent of the instructor. Hours to be arranged. Mr. Vanek. Not offered in 1969-70.

674. ECONOMIC PLANNING

Spring term. Hours to be arranged. Mr. Staller.

[675. ECONOMIC GROWTH MODELS]

Not offered in 1969-70.

[676. THE ECONOMY OF CHINA]

Not offered in 1969-70.

[678. ECONOMIC GROWTH IN SOUTHEAST ASIA]

Not offered in 1969-70.

[679. THEORY OF ECONOMIC DEVELOPMENT]

Not offered in 1969-70.

[685. SEMINAR IN MATHEMATICAL ECONOMICS]

Not offered in 1969-70.

ENGLISH

Mr. E. G. Fogel, Chairman; Messrs. M. H. Abrams, B. B. Adams, C. B. Adams, A. R. Ammons, Miss Judith Anderson, Messrs. D. N. Archibald, B. W. Bell, J. P. Bishop, Mrs. Jean Blackall, Messrs. J. D. Boyd, M. R. Brownell, S. M. Budick, A. F. Caputi, M. J. Colacurcio, V. A. De Luca, D. D. Eddy, J. P. Eichholz, R. H. Elias, S. B. Elledge, R. T. Farrell, D. H. Finlay, P. A. Gottschalk, B. L. Hathaway, G. H. Healey, N. H. Hertz, Mrs. Judith Herz, Messrs. T. D. Hill, R. D. Hume, Mrs. Carol Kaske, Messrs. R. E. Kaske, M. Kaufman, H. Kaye, C. S. Levy, P. L. Marcus, J. H. Matlack, W. P. Matthews, D. E. McCall, J. R. McConkey, F. D. McConnell, H. S. McMillin, Jr., F. E. Mineka, A. M. Mizener, D. Novarr, A. R. Parker, S. M. Parrish, E. Rosenberg, Miss Joanna Russ, Mr. D. R. Schwarz, Mrs. Sandra Siegel, Messrs. W. J. Slatoff, B. O. States, Jr., C. S. Strout, W. Wetherbee, R. G. Williams.

Students who plan to major in English should secure from the Department's office, 245 Goldwin Smith, a brochure containing suggestions for prospective majors. All students who are candidates for the major in English and all who are considering the possibility of a major in English will be assigned, if they wish, to a major adviser in the second term of the freshman year. Such students should apply to the chairman of the Department in the ten-day period before registration. Early assignment to a major adviser commits neither the student nor the Department. A student is a provisional major until he has completed English 251-252 and six hours of study in a foreign language (preferably in literature) in courses for which Qualification is a prerequisite. English 251-252 should be completed by the end of the sophomore year; the foreign language courses must be completed before the senior year. Applicants for the regular major must have achieved grades of at least C in all courses in English during the first two years.

Majors take a minimum of eight courses in English, or in other subjects approved for the major, numbered 300 or higher. The Department of English does not require specific upperclass courses, but it advises students to select courses in both the older and the more recent periods and to avoid overconcentration on a single genre. Courses at the 300 level (many of which are lectures) are, in the main, surveys of the major areas of English and American literature; they are open to sophomores who have completed English 251-252. Courses at the 400 level (most of which are discussions) are, in the main, more limited in focus and more specialized in content; discussion courses are restricted to about fifteen students, and seniors are given preference in electing them. Eight hours of work in writing at the 300 level or higher may be included in the minimum requirement for the major. Eight hours of work in satisfaction of the major may be taken outside the Department in courses numbered 300 or above in Comparative Literature, in a foreign literature, in American Studies, or in the Society for the Humanities, provided that these are approved by the student's adviser as correlating with courses elected within the Department.

The Honors program differs from the regular major primarily in

requiring that a student include among his major courses an Honors seminar, English 491 or 492 (normally in his junior year, but, on occasion, in his senior year), and an Honors essay course, English 493, in the fall term of his senior year. Permission to enroll in any course in English which is numbered 491, 492, or 493 will be granted by the Chairman of the Honors Committee in the ten days preceding preregistration. Applicants for Honors courses must have demonstrated achievement at the high level described in the Department's brochure.

The Distribution requirement in the humanities is satisfied by any two courses in English at the 200 level other than 203-204 and 205-206, but a student may not enroll in both 251 and 255, in both 252 and 256, or in both 245 and 248. The Seminar in Literature, LO, in the Six-Year Ph.D. Program may be used as one of these courses. The Distribution requirement in the expressive arts is satisfied in English by English 203-204 or 205-206.

For students not majoring in English, the Department makes available a variety of courses at all levels: some courses at the 200 level are open to freshmen, and all of them are open, without prerequisite, to sophomores; courses at the 300 level are open to juniors and seniors and to sophomores who have completed English 251-252; courses at the 400 level, most of which require the permission of the instructor, are open to specially qualified juniors and seniors.

Prospective teachers of English in secondary schools who seek temporary certification in New York State must fulfill all the requirements of the major. In addition, they elect a special program of three professional courses offered in the Department and in Education. A detailed statement about programs for teachers is available in the Office of the Department of English.

Courses for Freshmen

As part of the Freshman Humanities Program, the Department of English offers a large number of one-semester courses, each conducted in small sections with limited enrollment. The courses are concerned with various forms of writing (narrative, biographical, expository), with the study of specific areas in English and American literature, and with the relation of literature to culture. Students may elect any two of these courses during their first year to satisfy the Freshman Humanities requirement. Descriptions of these courses are found in the section called "Freshman Humanities Program" (page 34). See also English 237 and 239.

English as a Second Language

The following courses are offered by the Division of Modern Languages. Foreign students should consult a member of that Division in 106 Morrill Hall.

102. ENGLISH AS A SECOND LANGUAGE

Fall term. Credit six hours. Prerequisite, placement by the instructor. Hours to be arranged.

211-212. ENGLISH AS A SECOND LANGUAGE

Throughout the year. Credit three hours a term. Prerequisite, placement by the instructor. M W F 11:15.

Intermediate Courses

203-204. SPECIAL FORMS OF WRITING

Throughout the year. Credit three hours a term. English 203 or consent of the instructor prerequisite to English 204. Sections limited to fifteen. M W 12:20, T Th 10:10 or 2:30, and conferences to be arranged. Mr. Hertz and others.

An introductory course in the practice of writing narrative, verse, and allied forms.

205-206. ADVANCED COMPOSITION

Throughout the year. Credit three hours a term. English 205 or consent of the instructor prerequisite to English 206. Sections limited to eighteen. M W 9:05 or T Th 10:10, and conferences to be arranged. Mr. Mineka and others.

For sophomores, juniors, and seniors who, having performed creditably in the Freshman Humanities Program (or in equivalent courses elsewhere), desire to carry on work in expository, critical, and personal essays.

225-226. THE TWENTIETH CENTURY

Throughout the year. Credit three hours a term. First term not prerequisite to the second. Not open to freshmen. M W F 1:25. Fall term, Mr. McCall. Spring term, Mr. Marcus.

An examination of important works of fiction and poetry by Dickinson, Dreiser, Faulkner, Fitzgerald, Hemingway, Lawrence, Stevens, and West in the fall term, and by Eliot, Forster, Hardy, Huxley, James, Joyce, Woolf, Yeats, and others in the spring term.

237. THE READING OF FICTION

Either term. Credit three hours. Strongly recommended for prospective English majors; open to freshmen. May be used to satisfy either the Freshman Humanities requirement or the Distribution requirement in Humanities, but not both. Sections limited to twenty-two. Fall term, M W F 11:15. Spring term, M W F 2:30. Mr. Slatoff and others.

Forms of modern fiction, with emphasis on the short story and novella. Critical studies of works by English and American, as well as Continental writers, from 1880 to the present: Chekhov, James, Conrad, Faulkner, Mann, Kafka, and others.

239. THE READING OF POETRY

Either term. Credit three hours. Strongly recommended for prospective English majors; open to freshmen. May be used to satisfy either the Freshman Humanities requirement or the Distribution requirement in Humanities, but not both. Sections limited to twenty-two. Fall term, M W F 2:30. Spring term, M W F 11:15. Mr. Caputi and others.

Study of English and American poems, intended to help students speak and write articulately about poetry.

243. SHAKESPEARE

Either term. Credit three hours. Primarily for students who do not expect to major in English. Limited to twenty-five. Fall term, M W F 2:30. Mr. Kaufman. Spring term, M W F 3:35. Mr. Gottschalk.

A critical study of representative plays from the principal periods of Shakespeare's career.

245. STUDIES IN AMERICAN LITERATURE

Either term. Credit three hours. Primarily for students who do not expect to major in English. Limited to twenty-five. Fall term, M W F 3:35. Mrs. Blackall. Spring term, M W F 2:30. Mr. Bell.

Intensive study of major works by such writers as Melville, Poe, Whitman, James, Twain, Hemingway, Faulkner, Baldwin, Wright, and Ellison.

248. LITERATURE OF THE NEGRO EXPERIENCE IN AMERICA

Spring term. Credit three hours. Not open to freshmen. M W F 10:10. Mr. Matlack.

Examination of selected works by writers such as Douglass, Du Bois, Hughes, Wright, Baldwin, Ellison, Malcolm X, and LeRoi Jones. Assessment of forms and technique will be supplemented by close attention to such thematic concerns as responses to white society, definitions of freedom and liberation, and the emerging sense of black pride and self-identity.

251. GREAT ENGLISH WRITERS

Either term. Credit three hours. Open only to prospective majors in English. Available in the fall term to sophomores and to those freshmen who have been given advanced standing credit; available in the spring term to freshmen and sophomores. Sections limited to twenty-five. M W F 1:25 or T Th S 11:15. Mr. Parrish and others.

Studies in selected works of great English writers from Chaucer through Milton, with some consideration of the English literary tradition.

252. GREAT ENGLISH WRITERS

Either term. Credit three hours. Prerequisite, English 251. Sections limited to twenty-five. M W F 1:25 or T Th S 11:15. Mr. Parrish and others.

Studies in selected works of great English writers from Dryden to the twentieth century, with some consideration of the English literary tradition.

255-256. BRITISH LITERATURE

Throughout the year. Credit three hours a term. First term not prerequisite to the second. T Th S 12:20. Mr. Healey.

Lectures and commentary on some notable works by prominent English, Scottish, and Irish authors. First term: medieval balladists to Dr. Johnson. Second term: Robert Burns to James Joyce.

Courses for Upperclassmen

These courses are mainly intended for juniors and seniors. Courses numbered 300 are open to sophomores who have completed English 251-252.

306. THE EARLIEST ENGLISH LITERATURE

Spring term. Credit four hours. M W F 12:20. Mr. Hill.

Cultural backgrounds, reading, and critical analysis of Anglo-Saxon poetry in translation, pagan and Christian epic, elegy, heroic legend, and other forms. Attention will be given to the relations of this literature to that of later periods.

309. THE SIXTEENTH CENTURY

Fall term. Credit four hours. M W F 9:05. Mr. Levy.

The main traditions in English poetry from 1530 to 1603, with some attention to the prose of the period. Special emphasis on such figures as Wyatt, Sidney, Spenser, Marlowe, and Shakespeare.

310. THE SEVENTEENTH CENTURY

Spring term. Credit four hours. M W F 9:05. Mr. Finlay.

A survey of the lyric poetry and nonfictional prose of the century, with some emphasis on the relation of this literature to the historical, religious, and scientific developments of the age. Selected works by such writers as Donne, Herbert, Jonson, Herrick, Marvell, Bacon, Browne, and Burton.

315. THE AGE OF POPE

Fall term. Credit four hours. M W F 2:30. Mr. Brownell.

Readings: Dryden, Congreve, Pope, Gay, Swift, Thomson, and Young; Law, Locke, Shaftesbury, and Mandeville; Addison, Steele, and Lady Mary Wortley Montagu; Defoe, Richardson, Fielding, and Smollett. Topics: art, religion, philosophy, politics, manners, and taste in an age of elegance.

316. THE AGE OF JOHNSON

Spring term. Credit four hours. M W F 2:30. Mr. Archibald.

A study of the poetry, criticism, biography, and fiction of Johnson and his circle; the poetry of Gray, Burns, and others; the decline of neoclassicism.

317. THE ROMANTIC POETS

Fall term. Credit four hours. T Th S 11:15. Mr. Parker.

A critical study of the poetry of Blake, Wordsworth, Coleridge, Byron, Shelley, and Keats.

320. THE VICTORIANS

Spring term. Credit four hours. T Th S 11:15. Mr. Mineka.

The major poets and prose writers from Carlyle to Bernard Shaw, studied in relation to the thought of the time and to the literature of the twentieth century.

321. THE TWENTIETH CENTURY

Fall term. Credit four hours. M W F 10:10. Mr. Mizener.

The character of twentieth-century literature, as shown by the work of eight or ten major poets and novelists, from Yeats to Robert Lowell.

329. THE GROWTH OF AMERICAN LITERATURE

Fall term. Credit four hours. M W F 1:25. Mr. Colacurcio.

A literary history of America from Puritan beginnings to the Civil War.

330. AMERICAN LITERATURE SINCE THE CIVIL WAR

Spring term. Credit four hours. M W F 1:25. Mr. Elias.

A study of selected works by important American writers from Whitman to LeRoi Jones and William Melvin Kelley.

336. THE MODERN AMERICAN NOVEL

Spring term. Credit four hours. M W F 10:10. Mr. Slatoff.

A critical study of American fiction, beginning with Howells and James and concluding with selected contemporary novels.

337. THE NINETEENTH-CENTURY NOVEL

Fall term. Credit four hours. M W F 12:20.

A critical study of English fiction from Jane Austen to Conrad.

339. REPRESENTATIVE ENGLISH DRAMAS

Fall term. Credit four hours. M W F 11:15. Mr. McMillin.

Selected plays from the Middle Ages to the present century, with emphasis on literary and social contexts.

346. MODERN DRAMA

Spring term. Credit four hours. M W F 11:15. Mr. Kaufman.

A study of drama from Ibsen to the present day, including major continental playwrights, and giving special attention to Shaw, O'Casey, O'Neill, and Miller.

365. CHAUCER

Fall term. Credit four hours. T Th S 12:20. Mr. Farrell.

Reading and critical analysis: *Troilus* and a large selection from the *Canterbury Tales*.

368. SHAKESPEARE

Spring term. Credit four hours. M W F 11:15. Mr. Caputi.

An introduction to the works of Shakespeare, based on a selection of plays representative of the stages of his artistic development and the range of his achievement.

371. MILTON

Fall term. Credit four hours. T Th S 10:10. Mr. Novarr.

Study of Milton's poetry and selected prose, with emphasis on *Paradise Lost*.

[383. THE ENGLISH LANGUAGE]

Fall term. Credit four hours. T Th S 9:05. Not offered in 1969-70; see English 508.

385-386. NARRATIVE WRITING

Throughout the year. Credit four hours a term. Prerequisite, English 204 or 206 or consent of the instructor. Fall term: T Th 11:15 or 12:20 and conferences to be arranged. Messrs. Rosenberg and Slatoff. Spring term: T Th 12:20 and conferences to be arranged. Messrs. Hathaway and McCall.

A course in the writing of fiction; study of models; analysis of students' work.

387. VERSE WRITING

Fall term. Credit four hours. Prerequisite, consent of the instructor. T Th 1:25-3:20. Mr. Ammons.

The techniques of poetry; study of models; criticism of students' poems; personal conferences.

402. LITERARY CRITICISM

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 3:35. Mr. Boyd.

Study of some major critics in the English tradition, from Sidney and Dryden to Kenneth Burke and Northrop Frye.

406. SPENSER

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 9:05. Miss Anderson.

The realms of actuality and imagination in the poetry of Edmund Spenser. Emphasis on *The Faerie Queene*.

408. PROBLEMS IN THE RENAISSANCE

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 12:20. Mr. Eichholz.

The interplay of private consciousness and public virtue in various kinds of Renaissance literature. Montaigne's *Essays*, Castiglione's *The Courtier*, and Machiavelli's *The Prince* will provide the set of themes to be explored in Sidney, Spenser, Shakespeare, Jonson, Milton, and Marvell.

412. ELIZABETHAN AND JACOBEOAN DRAMA

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. T Th S 11:15. Mr. Novarr.

Critical study of plays by Marlowe, Marston, Jonson, Beaumont, Fletcher, Webster, Ford, and others.

413. SHAKESPEARE

Fall term. Credit four hours. *Discussion*. Prerequisite, English 368 and consent of the instructor. M W F 11:15. Mr. Caesar Adams.

An intensive study of three or four of Shakespeare's plays.

417. THE SCHOOL OF DONNE

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 11:15.

The mind and poetic art of Donne, Marvell, and related poets.

424. DRYDEN AND HIS TIME

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 11:15. Mr. Budick.

The major poetry, drama, and criticism of Dryden and his contemporaries, and the ways in which the English literary tradition was modified by Restoration science, politics, philosophy, and theology.

431. EIGHTEENTH-CENTURY INTELLECTUAL PROSE

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 9:05. Mr. Eddy.

A study of selected works by Locke, Shaftesbury, Mandeville, Hume, Burke, and J. Warton.

436. ENGLISH POETRY AND THE SUBLIME

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. T Th S 10:10. Mr. Hertz.

Some theoretical works on the notion of sublime (Longinus, Burke, Kant) will be considered. Emphasis on poems of the eighteenth and early nineteenth century (by Thomson, Collins, Gray, Young, Akenside, Wordsworth) which were considered "sublime" by contemporary readers.

437. VISIONARY LITERATURE OF THE ROMANTIC PERIOD

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. T Th S 10:10. Mr. De Luca.

The visionary mode in Romantic literature, with emphasis on the writings of Blake. Selected readings from relevant works of Wordsworth, Coleridge, De Quincey, and others.

438. MASTERWORKS OF THE ROMANTIC PERIOD

Spring term. Credit four hours. T Th S 10:10. Mr. Abrams.

A critical study of major Romantic achievements in various forms: Blake's *The Four Zoas*, Wordsworth's *Prelude*, Shelley's *Prometheus Unbound*, Keats's *Fall of Hyperion*, and Byron's *Don Juan*.

442. THE OLD WORLD AND THE NEW

Spring term. Credit four hours. T Th S 9:05. Mr. Strout.

The American experience of Europe, as reflected in literature, studied in relation to historical development. Selected writings of Irving, Hawthorne, Melville, Twain, James, Hemingway, and others.

444. HAWTHORNE AND MELVILLE

Either term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. Fall term, M W F 12:20. Mr. Bishop. Spring term, M W F 1:25. Mr. Kaye.

Emphasis on critical study of the major works of fiction.

447. JAMES AND TWAIN

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 1:25 or 2:30. Mrs. Blackall and Mr. McCall.

Intensive examination of selected texts, with special attention to fictional methods and to portrayal of the American character.

448. STUDIES IN NINETEENTH-CENTURY AMERICAN LITERATURE

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. T Th S 11:15. Mr. Matlack.

Emphasis on such major writers as Emerson, Thoreau, and Whitman.

451. MAJOR VICTORIAN POETS

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 3:35.

The poetry of Tennyson, Browning, and Arnold, and a brief survey of the Pre-Raphaelites.

455. LATE VICTORIAN AND EDWARDIAN LITERATURE (1890-1914)

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. T Th S 11:15. Mr. Parrish.

The ways in which such writers as Hopkins and Housman, Hardy and Moore, Wilde and Shaw, Beerbohm and Wells changed Victorian attitudes and influenced our own.

457. STUDIES IN THE NOVEL

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. T Th S 11:15. Mr. Schwarz.

Topic for 1969-70: Hardy, Conrad, and Lawrence.

459. MODERN AMERICAN POETRY

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 10:10. Mr. Kaye.

The relationship between "modern" and "traditional" poetry in the work of Wallace Stevens, William Carlos Williams, Yvor Winters, and J. V. Cunningham.

461. STUDIES IN MODERN FICTION

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. T Th S 9:05. Mr. McConnell.

A survey of the modern English and American novel with emphasis on the

way narrative styles reflect and produce distinctive imaginative worlds. Readings in such authors as James, Woolf, Stein, Hemingway, Lowry, Mailer, Burroughs, Barth, Malamud, and Durrell.

462. TWENTIETH-CENTURY POETS

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 10:10. Mr. Marcus.

Study of major poets, with emphasis on Yeats.

463. STUDIES IN MODERN DRAMA

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 10:10. Mr. Kaufman.

A study of themes and dramatic form in T. S. Eliot, O'Casey, Tennessee Williams, and the postwar English playwrights, such as Pinter and Osborne.

466. THE ANGLO-IRISH LITERARY TRADITION

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 12:20. Mr. Archibald.

A study of the major works of such writers as Swift and Burke, Joyce and Yeats, of some relationships between them, and of what this suggests about the Irish situation.

467. THE AFRO-AMERICAN NOVEL AND ITS TRADITION

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 3:35. Mr. Bell.

An historical study of the Afro-American novel, defining and assessing its major characteristics; focus on the novels of Paul Laurence Dunbar, Charles Waddell Chesnutt, James Weldon Johnson, Jean Toomer, Richard Wright, Ralph Ellison, James Baldwin, and LeRoi Jones.

468. CONTEMPORARY AMERICAN POETRY

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 2:30. Mr. Matthews.

Emphasis on the work of Robert Creeley, Robert Lowell, Theodore Roethke, and James Wright; selective readings from the work of such poets as A. R. Ammons, Robert Bly, Edward Dorn, Randall Jarrell, W. S. Merwin, Charles Olson, Louis Simpson, Gary Snyder, and Richard Wilbur.

471. THE MODERNIST TRADITION IN POETRY

Fall term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 12:20. Mr. Hathaway.

A study of the poetic theory and practice of the major poets of our time, principally American, with emphasis on Pound, Frost, Eliot, Stevens, MacLeish, Lowell, Roethke, Ginsberg, and Berryman.

474. EXPLORATIONS IN COMEDY

Spring term. Credit four hours. *Discussion*. Prerequisite, consent of the instructor. M W F 2:30. Mr. Hume.

Emphasis on English drama from 1590 to the present, with excursions into Greek, Roman, and French drama in translation and some nondramatic works. Changing concepts of comic form and the adequacy of some modern theories of comedy will be considered.

480. STUDIES IN AMERICAN CULTURE

Spring term. Credit four hours. *Discussion*. Prerequisite, senior standing and consent of the instructor. Th 1:25-3:20. Mr. Elias.

Topic for 1969-70: The 1920's. An interdisciplinary study of the status of the individual as seen in the decade's view of children and the family, justice, politics, literature, painting, and philosophy, with special attention to the significance of the racial self-discovery evinced by Garvey's Black Nationalism and the Harlem Renaissance. Works written during the Twenties will constitute the principal source materials.

485-486. SEMINAR IN WRITING

Throughout the year. Credit four hours a term. *Discussion*. Prerequisite, English 385-386 or consent of the instructor. W 1:25-3:20. Fall term, Mr. McConkey. Spring term, Mr. McCall.

For advanced writing students who should be prepared to complete, during the year, a writing project in verse, narrative, or essay. Exploration of principles of literary theory pertinent to projects undertaken.

489. THE TEACHING OF ENGLISH

Fall term. Credit four hours. W 2:30-4:25. Mr. Barry Adams.

Emphasis on the teaching of reading, writing, and language. Undergraduates accepted for the English-teaching program take this course in their senior year; all others must secure consent of the instructor.

ALLEGORY AND SYMBOLISM

(Comparative Literature 402)

ANCIENT AND RENAISSANCE LITERARY CRITICISM

(Comparative Literature 401)

MEDIEVAL ARTHURIAN LITERATURE

(Comparative Literature 404)

MEDIEVAL LITERATURE

(Comparative Literature 333-334)

MYTH AND LITERATURE

(Comparative Literature 416)

THE MODERN EUROPEAN NOVEL

(Comparative Literature 351-352)

TOPICS IN EUROPEAN FICTION

(Comparative Literature 469)

THE LITERATURE OF EUROPE IN THE MODERN PERIOD

(Comparative Literature 329-330)

WORLD DRAMA

(Comparative Literature 325-326)

Honors Courses

Open only to juniors and seniors who have secured prior permission from the Chairman of the Honors Committee. English 493 and 494 are limited to seniors who have received permission.

491 B. THE MODE OF ROMANCE IN CHAUCER AND SHAKESPEARE

Fall term. Credit four hours. T Th 1:25-3:20. Mrs. Herz.

A reading of selected tales and the *Troilus and Criseyde* of Chaucer and selected plays of Shakespeare (including *A Midsummer Night's Dream*, *The Winter's Tale*, and *The Tempest*) in a study of the mode of romance.

491 G. THE CRITICISM OF POETRY

Fall term. Credit four hours. T Th 1:25-3:20. Mr. Abrams.

Lyric and narrative poems from the Elizabethan age to the present, together with recent essays in the criticism of these poems. One undertaking will be to define and resolve the causes of disagreement in interpretation and evaluation.

491 J. FICTION AND THE IRRATIONAL

Fall term. Credit four hours. T Th 1:25-3:20. Mr. Rosenberg.

Intensive study of several novels, to be chosen from among the following: Flaubert, *Madame Bovary*; Tolstoy, *Kreutzer Sonata*; Dostoyevski, *The Idiot*; Dickens, *Edwin Drood*; De Quincey, *Confessions of an English Opium Eater*; Hardy, *Mayor of Casterbridge*; Mann, *Dr. Faustus*. Short papers and reports.

491 K. STUDIES IN DRAMATIC FORM

Fall term. Credit four hours. T Th 1:25-3:20. Mr. States.

A study of dramatic theory and form. Selected readings in criticism and in English drama from Elizabethan times to the present.

492 F. FORMS OF EIGHTEENTH-CENTURY LITERATURE

Spring term. Credit four hours. T Th 1:25-3:20. Mr. Budick.

A study of the development and function of form in the major imaginative works of Dryden, Pope, Johnson, and some of their contemporaries.

492 H. DOCTRINE AND DISCIPLINE: THE POET-CRITICS

Spring term. Credit four hours. T Th 1:25-3:20. Mrs. Mermin.

A study of some poet-critics, exploring in particular the relation between their critical theories and their poetry. The chief emphasis will be on Matthew Arnold and T. S. Eliot, with briefer consideration of other writers, such as Sidney, Dryden, and Wordsworth.

492 J. THE NOVEL OF MANNERS

Spring term. Credit four hours. T Th 1:25-3:20. Mr. Mizener.

A study of the ways of presenting experience and expressing values in the novel of manners and a consideration of the sense of reality that leads writers to adopt this form. Examples of the novel of manners will be chosen from the work of such writers as Jane Austen, Edith Wharton, James Gould Cozzens, Anthony Powell, and Kingsley Amis.

492 L. FROM BERNARD SHAW TO HAROLD PINTER

Spring term. Credit four hours. T Th 1:25-3:20. Mr. Caputi.

Study of the principal directions of contemporary drama in English, with particular emphasis on the work of Shaw, O'Neill, Miller, and Pinter.

493. HONORS ESSAY TUTORIAL

Fall term. Credit four hours. Hours and instructor by arrangement.

494. INDEPENDENT STUDY

Spring term. Credit four hours. Prerequisite, successful completion of an Honors course and of English 493. Hours and instructor by arrangement.

Graduate Courses

These courses are for graduate students, but a few especially qualified undergraduates may enroll in 500-level courses. All students must secure the consent of the instructor before registering.

500. INTRODUCTION TO ADVANCED RESEARCH

Spring term. Credit four hours. Mr. Novarr.

A study of methods and materials relevant to the solution of problems in scholarly and critical interpretation. For candidates for the Ph.D. degree; normally to be taken in the spring semester of the first year of graduate study.

501. READINGS IN OLD ENGLISH

Fall term. Credit four hours. Mr. Farrell.

Elements of Old English grammar and readings in the shorter literary texts.

502. BEOWULF

Spring term. Credit four hours. Prerequisite, English 501. Mr. Farrell.

A reading of the poem in Old English and discussion of the literary problems which it presents.

503. MIDDLE ENGLISH

Fall term. Credit four hours. Mr. Kaske.

Reading and critical analysis of major works, excluding Chaucer and the drama.

504. CHAUCER

Spring term. Credit four hours. Mr. Kaske.

Reading and critical analysis, with emphasis on *Troilus and Canterbury Tales*.

[506. PHILOLOGICAL PROBLEMS IN THE STUDY OF ENGLISH LITERATURE]

Spring term. Credit four hours. Mr. Farrell. Not offered in 1969-70.

[507. THEORY OF PROSE]

Fall term. Credit four hours. Mr. Elledge. Not offered in 1969-70.

508. THE ENGLISH LANGUAGE

Spring term. Credit four hours. Mr. Farrell.

A study of major problems in the history and development of the language from the Old English period to the present time. Though the course will be based on a historical survey, students will be given freedom to work in areas of particular interest, whether ancient or modern. Some knowledge of Old English is very strongly advised. Open to undergraduates who have the consent of the instructor.

510. GRAMMATICAL ANALYSIS

Spring term. Credit four hours. Mr. Hathaway.

Study of the structures of English revealed in the transformation of basic components of predications.

512. MEDIEVAL DRAMA

Spring term. Credit four hours. Mr. Barry Adams.

Dramatic forms and traditions from the liturgical drama to the Elizabethan period.

[513. ELIZABETHAN AND JACOBEAN DRAMA]

Fall term. Credit four hours. Mr. McMillin. Not offered in 1969-70.

515. CURRENTS OF THOUGHT IN THE EARLY RENAISSANCE

Spring term. Credit four hours. Open to qualified undergraduates. Miss Anderson.

The awareness of history and human possibility from the age of Erasmus, Colet, and More to that of Shakespeare. Close attention to a limited series of literary and historical works of the sixteenth century, for example, More's *Richard*, the Chronicles, Shakespeare's *Richard III*.

[517. EPIC AND ALLEGORY IN THE ENGLISH TRADITION]

Fall term. Credit four hours. Miss Anderson. Not offered in 1969-70.

518. STUDIES IN ELIZABETHAN LITERATURE

Spring term. Credit four hours. Mr. Levy.

Particular emphasis upon the shorter forms of Elizabethan verse, with some consideration of Continental influences.

[520. JONSON AND DRYDEN]

Spring term. Credit four hours. Mr. Novarr. Not offered in 1969-70.

[522. MILTON]

Spring term. Credit four hours. Mr. Levy. Not offered in 1969-70.

527. EIGHTEENTH-CENTURY LITERATURE

Fall term. Credit four hours. Mr. Brownell.

Readings in Pope and his contemporaries, with attention to relationships between literature and the fine arts.

530. THE NEW ENGLAND MIND, 1620-1860

Spring term. Credit four hours. Mr. Colacurcio.

The major texts of Puritanism studied in relation to the literary productions of Emerson, Hawthorne, and Melville. The emphasis will be on varieties of Puritan inheritance.

533. THE INTELLECTUAL ORIGINS AND DEVELOPMENT OF THE ROMANTIC MOVEMENT IN AMERICA

Fall term. Credit four hours. Mr. Strout.

The intellectual and social context and genesis of American romanticism, with particular emphasis on the theme of antirationalism.

[535. THE INTELLECTUAL ORIGINS OF THE MODERN CONSCIOUSNESS IN AMERICAN LITERATURE AND THOUGHT]

Fall term. Credit four hours. Mr. Strout. Not offered in 1969-70.

537. STUDIES IN AMERICAN LITERATURE

Fall term. Credit four hours. Mr. Elias.

Naturalism in the United States: its social and cultural context; its European and American beginnings; its expression in the theory and practice of such writers as Hamlin Garland, Stephen Crane, Frank Norris, Theodore Dreiser, and Jack London; and its relation to the work of Henry Adams, Gertrude Stein, and Sherwood Anderson.

549-550. CREATIVE WRITING

Throughout the year. Credit four hours a term. Fall term, Mr. Hathaway. Spring term, Mr. Ammons.

553. STUDIES IN ENGLISH POETRY

Spring term. Credit four hours. Mr. Abrams.

Topic for 1969-70: Imagery and organization in a variety of narrative, descriptive, and lyric poems, from Spenser to Wallace Stevens.

562. CHARACTER AND IDENTITY IN THE TRAGEDIES OF SHAKESPEARE

Spring term. Credit four hours. Mr. Fogel.

A study of how Shakespeare, in his evolution as a tragic artist, brings into ever sharper focus the problematic character of the hero and the question of his identity. The relation of such concerns to the design of the play and to Renaissance and modern philosophies of man. Special emphasis on Hamlet, Othello, Lear, Antony, and Coriolanus, with collateral study of tragic heroes in such dramatists as Chapman and Webster.

[564. DRAMATIC LITERATURE: SHAW AND O'NEILL]

Spring term. Credit four hours. Mr. Caputi. Not offered in 1969-70.

567. DRAMATIC CRITICISM

Fall term. Credit four hours. Mr. Caputi.

A study of the principal modes and problems of dramatic criticism. The work will consist of studying plays as well as critics, and of testing and evaluating as well as describing established lines of critical inquiry.

[571. ROMANTIC POETRY]

Fall term. Credit four hours. Mr. Parker. Not offered in 1969-70.

[572. THE ROMANTIC PERIOD]

Spring term. Credit four hours. Mr. Abrams. Not offered in 1969-70.

573. ROMANTIC AND MODERN WRITERS

Fall term. Credit four hours. Mr. Parker.

Readings in such nineteenth- and twentieth-century writers as Wordsworth, Shelley, Keats, Eliot, Lawrence, and Stevens, with consideration of modern responses to problems raised by the Romantics.

575. VICTORIAN PROSE

Fall term. Credit four hours. Mr. Mineka.

Major emphasis upon writers of nonfictional prose, but with some attention to the novel.

576. VICTORIAN POETRY

Spring term. Credit four hours. Mr. Mineka.

Major emphasis upon Tennyson, Browning, and Arnold, but with some study of other Victorian poets.

582. STUDIES IN MODERN FICTION

Spring term. Credit four hours. Mr. Slatoff.

Topic for 1969-70: A study of "blackness" in selected fiction by both white and black authors such as Conrad, Faulkner, Wright, Ellison, and Baldwin.

[583. BOSTON AND AMERICAN LITERATURE]

Fall term. Credit four hours. Mr. Bishop. Not offered in 1969-70.

584. FORMS OF THE NOVEL

Spring term. Credit four hours. Mrs. Blackall.

Topic for 1969-70: Gothic Romance in eighteenth-, nineteenth-, and twentieth-century manifestations.

587. VOICE AND TONE

Fall term. Credit four hours. Mr. McConkey.

An examination of alterations in voice and tone in nineteenth- and twentieth-century fiction. Novels selected from the work of such writers as Eliot, Trollope, Forster, and Pynchon.

[591. TWENTIETH-CENTURY LITERATURE: YEATS]

Fall term. Credit four hours. Mr. Archibald. Not offered in 1969-70.

594. STUDIES IN TWENTIETH-CENTURY AMERICAN LITERATURE

Spring term. Credit four hours. Mr. Mizener.

An examination of the work of two or three representative poets of the twentieth century (such as Frost or Stevens or Williams) and two or three representative writers of fiction (such as Faulkner or Fitzgerald or Hemingway).

598. MASTER'S ESSAY

Spring term. Credit four hours. Members of the Department.

602. ADVANCED OLD ENGLISH

Spring term. Credit four hours. Mr. Hill.

Topic for 1969-70: Studies in Old English Christian poetry.

[604. TEXTUAL CRITICISM OF OLD ENGLISH POETRY]

Spring term. Credit four hours. Mr. Farrell. Not offered in 1969-70.

608. STUDIES IN MEDIEVAL LITERATURE

Spring term. Credit four hours. Mr. Kaske.

Advanced research in English (and other) medieval literature.

[616. STUDIES IN THE SIXTEENTH CENTURY: SIR PHILIP SIDNEY]

Spring term. Credit four hours. Mr. Fogel. Not offered in 1969-70.

617. STUDIES IN THE SEVENTEENTH CENTURY: JOHN DONNE

Fall term. Credit four hours. Mr. Novarr.

An intensive examination of the scholarly and critical work pertinent to an understanding of Donne and of the late Renaissance.

619. STUDIES IN ELIZABETHAN-JACOBEAN DRAMA

Fall term. Credit four hours. Mr. McMillin.

Close critical and theatrical analysis of three major works: Jonson, *The Alchemist*; Shakespeare, *The Winter's Tale*; Webster, *The Duchess of Malfi*. The plays will be read in the context of Jacobean drama from 1603 to 1613.

[643. AUGUSTAN LITERATURE: POPE]

Fall term. Credit four hours. Mr. Brownell. Not offered in 1969-70.

671. WORDSWORTH

Fall term. Credit four hours. Mr. Parrish.

Critical and textual studies based upon the Dove Cottage manuscript archive.

675. ROMANTIC POETRY AND ROMANTIC CRITICISM

Fall term. Credit four hours. Mr. Abrams.

Coleridge's *Biographia Literaria*, in the context of the major works Coleridge discusses, especially the poetry and criticism of Wordsworth.

[678. DICKENS]

Spring term. Credit four hours. Mr. Rosenberg. Not offered in 1969-70.

[684. STUDIES IN AMERICAN FICTION: FAULKNER]

Spring term. Credit four hours. Mr. Slatoff. Not offered in 1969-70.

GEOLOGICAL SCIENCES

(Geology, Geochemistry, Geophysics, Geobiology,
Physical Geography, Applied Fields)

Mr. G. A. Kiersch, Chairman; Messrs. A. L. Bloom, B. Bonnichsen, L. Y. Chang, K. F. Clark, E. D. McKee, S. S. Philbrick, J. W. Wells.

For admission to a major in geological sciences, students should complete Geology 101-102, Mathematics 111-112, and Chemistry 107-108, and should be officially accepted by the Departmental major adviser. Students majoring in geological sciences in addition complete the following: Physics 207-208; a three-credit-hour course in mechanical drawing; and a two-credit-hour course in plane surveying. Recommended as further courses are Mathematics 213 and physical chemistry.

After admission to the major, the minimum requirements are: (1) Geology 351-352, 322, 441, 471-472, and 490; (2) two elective courses in geology numbered 300 or higher; and (3) eight semester hours' credit at a designated summer camp in field geology. The classical aspects of geology, including field mapping, are integrated with experimental and theoretical studies to give a balanced view of geological science.

Students considering graduate study in the physical branches of geological science should select a Distribution sequence from mathematics, physics, chemistry, or engineering; whereas those planning graduate study in aspects of geobiology should elect a Distribution sequence of four courses in biological science.

Students wishing certification as earth science teachers must take courses in geological sciences in their Science Education program. Some appropriate groupings are: Geology 212, 312, 314 and 441; Geology 202, 441, 471, 472; Geology 351, 352 and 461, 462 or 451, 452; Geology 322, 421, 441, 542.

DISTRIBUTION REQUIREMENT. The Distribution requirement in physical sciences is satisfied in geological sciences by Geology 101-102.

Geography, Physical

FRESHMAN AND SOPHOMORE COURSES

111. EARTH SCIENCE

Fall term. Credit three hours (see Earth Science Laboratory 113). Combine with Geography 212 for a survey of physical geography. Lectures, M W F 9:05. Mr. Bloom.

Physical geography, including the spatial relationships of the earth, moon, and sun that determine the figure of the earth, time, seasons, atmospheric and oceanic circulation, and climates.

113. EARTH SCIENCE LABORATORY

Fall term. Credit one hour. To be taken concurrently with Earth Science 111. Laboratory, W or Th 2-4:25. Mr. Bloom.

Observation and calculation of daily, monthly, and seasonal celestial events; topographical mapping and map interpretation; world climatic regions.

212. MINERAL RESOURCES

Spring term. Credit three hours. Lectures, M W F 9:05. Mr. Clark.

Utilization of and our dependence upon mineral resources; their nature, occurrence, distribution, and availability at home and abroad. Political and economic aspects of their availability and control.

JUNIOR, SENIOR, AND GRADUATE COURSES

312. GEOGRAPHY OF ANGLO-AMERICA

Spring term. Credit four hours. Prerequisites, Geography 111 or Geology 102. Offered in alternate years. Lectures, M W F 9:05 and additional assigned problems. Staff.

The geographic provinces of Anglo-America, their geomorphic expression, climates, resources, development, and interrelationships.

[314. CONTINENTAL GEOGRAPHY]

Spring term. Credit four hours. Prerequisites, Geography 111 or Geology 102. Offered in alternate years. Lectures, M W F 9:05 and additional assigned problems. Staff. Not offered in 1969-70.

610. SPECIAL WORK

Throughout the year. Credit two hours a term. Prerequisite, consent of the instructor. Staff.

Special or original investigations in physical geography on the graduate level.

General Geology

FRESHMAN AND SOPHOMORE COURSES

Principles and Processes

101. INTRODUCTORY GEOLOGICAL SCIENCE

Fall term. Credit three hours. Lectures, T Th 11:15. Two scheduled preliminary examinations will be held at 7:30 P.M. during the term. Laboratory, M T W Th or F 2-4:25, S 10:10-12:35. Field trips. Mr. Philbrick and staff.

Designed to give general students a comprehensive understanding of the earth processes, features, and history. Provides the basic knowledge necessary for more specialized courses or a major in geological science.

Study of the earth, particularly materials, structure, internal condition, and the physical and chemical processes at work. Principles of interpretation of earth history, evolution of continents, oceans, mountain systems, and other features; development of its animal and plant inhabitants.

102. INTRODUCTORY GEOLOGICAL SCIENCE

Spring term. Credit three hours. Prerequisite, Geology 101. Lectures, T Th 11:15. Two scheduled preliminary examinations will be held at 7:30 P.M. during the term. Laboratory, M T W Th or F 2-4:25, S 10:10-12:35. Field trips. Mr. Philbrick and staff.

A continuation of Geology 101.

202. ANCIENT LIFE

Spring term. Credit three hours. No prerequisite, but Geology 102 is desirable. Lectures, M W F 11:15. Mr. Wells.

A cultural course devoted to a review of the fossil remains of life in the geologic past as the main basis of the concept of organic evolution. Vertebrate forms from fish to man are stressed.

203. GEOLOGY FOR ENGINEERS

Fall term. Credit three hours. Lectures, T Th 9:05. Laboratory, T W or Th 1:25-4:25. Two scheduled preliminary examinations will be held at 7:30 P.M. during the term and a laboratory examination will be held at 7:30 P.M. the last week of the term. Field trips. Mr. Kiersch.

The principles of geological science with emphasis on the physical phenomena, rock properties, natural environments, and historical events important in applied science. The cause and effect of geological problems encountered in the planning, construction, and operation of engineering works are analyzed in the laboratory along with the influence of environmental factors.

JUNIOR, SENIOR, AND GRADUATE COURSES

Physical Processes

322. STRUCTURAL GEOLOGY - TECTONICS

Spring term. Credit four hours. Prerequisite, Geology 102 or 203, and 351; 352 recommended. Lectures, M W 11:15. Laboratory, M 2-4:25, and additional assigned problems. Field trips, Mr. Kiersch.

Nature, origin, and recognition of geologic structures. Behavior of geologic

materials, stresses, geomechanical and tectonic principles applied to the solution of geologic problems. Analysis of structural features by three-dimensional methods.

421. SEDIMENTATION

Fall term. Credit four hours. Prerequisite, Geology 352; Geology 441 recommended. Lectures, M W 9:05. Laboratory T 2-4:25, and additional laboratory work. Field trips. Messrs. Philbrick and Kiersch. Alternate-year course.

Source materials, mechanics of transport and dispersal, depositional environments, lithification and diagenesis of sediments. Analysis of common problems in applied fields due to these phenomena.

522. FLUVIAL PROCESSES

(Also Civil Engineering 2333)

Spring term. Credit two hours. Offered jointly with the School of Civil Engineering on demand. Prerequisite, consent of the instructor. Hours to be arranged. Messrs. Graf and Kiersch.

The common problems of fluvial processes, hydraulics, and sediment transport are studied along with the appropriate analytical methods and experimental techniques.

441. GEOMORPHOLOGY

Fall term. Credit four hours. Prerequisite, Geology 102. Lectures, T Th 9:05. Laboratory, T 2-4:25, and additional assigned problems. Mr. Bloom.

Description and interpretation of land forms in terms of structure, process, and stage.

542. GLACIAL AND PLEISTOCENE GEOLOGY

Spring term. Credit three hours. Prerequisite, Geology 441 or consent of the instructor. Lectures, T Th 9:05. Laboratory, T 2-4:25. Several Saturday field trips. Mr. Bloom.

Glacial processes and deposits and the stratigraphy of the Pleistocene.

444. GEOLOGICAL OCEANOGRAPHY

Spring term. Credit three hours. Prerequisite, Geology 102 or Biological Sciences 461. Lectures, M W F 9:05. Field trips. Mr. Bloom.

Shoreline erosion, transportation and deposition; origin and structure of continental shelves and ocean basins. Geologic processes and geomorphic development in the marine environment.

Geochemistry

Mineral Materials and Processes

351. MINERALOGY

Fall term. Credit four hours. Prerequisite, Geology 102, Chemistry 108. Lecture, M 10:10. Laboratory, W F 2-4:25, and additional assigned problems. Mr. Chang.

Crystallography, crystal chemistry, and systematic mineralogy of the ore and rock-forming minerals.

352. PETROLOGY

Spring term. Credit four hours. Prerequisite, Geology 351. Lectures, M F

10:10. Laboratory, Th 2-4:25 and additional assigned problems. Mr. Bonnichsen.

Composition, classification, and origin of igneous, sedimentary, and metamorphic rocks.

451. OPTICAL MINERALOGY

Fall term. Credit four hours. Prerequisite, Geology 351. Lecture, T Th 11:15. Laboratory, F S 9:05-12:20, and additional assigned problems. Mr. Bonnichsen.

Optical properties of crystals and their application to the determination and study of common rock-forming minerals with the petrographic microscope.

452. OPTICAL PETROGRAPHY

Spring term. Credit four hours. Prerequisites, Geology 352 and 451. Lecture, T Th 11:15. Laboratory, F S 9:05-12:20, and additional assigned problems. Mr. Bonnichsen.

Description, classification, and determination of the origin of igneous, metamorphic, and sedimentary rocks by the use of the petrographic microscope.

551. GEOCHEMISTRY

Fall term. Credit three hours. Prerequisite, Geology 352. Lectures, M W F 8. Mr. Chang.

Distribution of major and minor elements in the earth, geochemical cycles of the elements, and chemistry of weathering and petrogenesis.

554. X-RAY ANALYSIS

Spring term. Credit two hours. Prerequisite, Geology 352 or consent of the instructor. Lecture, W 12:20. Laboratory, F 2-4:25. Mr. Chang.

Theory and use of x-ray diffraction and spectroscopy in identification and analysis of minerals, rocks, and soils.

653. ADVANCED PETROLOGY

Fall term. Credit three hours. Prerequisite, Geology 452. Lectures, T Th 9:05. Laboratory, Th 2-4:25. Mr. Bonnichsen.

Methods of study, geologic and geochemical relationships, and petrogenesis of igneous and metamorphic rocks.

656. ADVANCED MINERALOGY

Spring term. Credit three hours. Prerequisites, Geology 452 and 554. Lectures, T Th 10:10. Laboratory, W 2-4:25. Mr. Chang.

A theoretical treatment of the crystal chemistry and thermodynamics of rock-forming minerals.

Mineral Deposits

461. MINERAL DEPOSITS: METALS

Fall term. Credit four hours. Prerequisite, Geology 352. Lectures, M W F 10:10. Laboratory, F 2-4:25. Field trips. Mr. Clark.

Principles and processes involved in the formation of mineral deposits. Modes of occurrence, origin, distribution, and utilization of the major, rare, and minor metals.

462. MINERAL DEPOSITS: NONMETALS

Spring term. Credit four hours. Prerequisite, Geology 461 or consent of the instructor. Lectures, M W F 10:10. Laboratory, F 2-4:25. Field trips. Mr. Clark.

Properties, occurrence, associations, distribution, and economic utilization of the industrial minerals and rocks.

[563. ORE MICROSCOPY]

Fall term. Credit two hours. Offered in alternate years. Prerequisites, Geology 451 and 461. Laboratory, F S 7:30-9:55 A.M. Mr. Clark. Not offered in 1969-70.

Geophysics

[581. EXPLORATION GEOPHYSICS]

Fall term. Credit three hours. Offered in alternate years. Prerequisites, Physics 208, Geology 102 or 203; recommended, Geology 322. Lectures, T Th 9:05, Laboratory S 10:10-12:35. Mr. Clark and staff. Not offered in 1969-70.

583. PHYSICS OF THE EARTH

Fall term. Credit three hours. Prerequisites, Geology 322, Math. 112, Physics 208. Hours to be arranged. Staff.

Theory and field measurements of the earth's gravitational, magnetic, seismic, electrical, thermal, and radioactive properties.

584. SEISMOLOGY

Spring term. Credit three hours. Prerequisites, Geol. 583. Hours to be arranged. Staff.

Theory of stress and strain, seismic wave propagation, earthquake studies, and observational seismology.

586. SEMINAR IN ROCK DEFORMATION—GEOMECHANICS

Spring term. Credit two hours. Prerequisites, Geology 583 and 533. Hours to be arranged. Staff.

Review of stress analysis and behavior of materials, both the rock mass and sample. Fundamentals of deformation pertaining to the crustal rocks and the problems of applied geological sciences.

Applied Geological Science

532. HYDROGEOLOGY

Spring term. Credit three hours. Offered in alternate years. Prerequisites, Geology 322, 352; Geology 441 recommended. Lectures, M W 9:05. Laboratory, T 2-4:25 and field trips. Mr. Philbrick.

Hydrologic cycle and water provinces; occurrence, movement, quantity, and chemical quality of ground water in porous media. Water resources development.

533. ENGINEERING GEOLOGY—THEORY AND ENVIRONMENTS

Fall term. Credit three hours. Offered in alternate years. Prerequisites, Geology 322, 352; recommended, Geology 441. Lectures, M W 11:15. Laboratory, M 2-4:25 and field trips. Mr. Kiersch.

Advanced study of the physical phenomena and rock properties of special importance from the planning through the operation of stages of engineering works; includes underground fluids, subsidence, gravity movement, seismicity, geomechanics and stresses, rock mechanics, weathering, and geologic materials of construction. Analysis of geologic problems encountered in practice; predicting the influence of natural and man-made environmental factors.

[535. ENGINEERING GEOLOGY—PRACTICE]

Fall term. Credit three hours. Offered in alternate years. Prerequisites, Geology 533 or Geology 322-352, and 441. Lectures, M W 9:05. Laboratory, T 2-4:25 and field trips. Mr. Philbrick. Not offered in 1969-70.

561. FUNDAMENTALS OF MINING GEOLOGY

Fall term. Credit three hours. Offered in alternate years. Prerequisites, Geology 461 and 462. Lectures, M W F 10:10. Assigned problems. Field trips. Mr. Clark.

Principles of geological, geophysical, and geochemical techniques used in mineral exploration. Mining geology, guides to ore, mining methods.

562. ECONOMICS OF MINERAL DEPOSITS

Spring term. Credit three hours. Offered in alternate years. Prerequisites, Geology 461 and 462; recommended, Geology 561. Lectures, M W F 10:10. Assigned problems. Mr. Clark.

Sampling and ore estimation. Cutoff, grade, tonnage, and economic factors related to mining and mineral marketing. Financial calculations and procedures used in mineral property valuation.

[582. EXPLORATION GEOLOGY]

Spring term. Credit three hours. Offered in alternate years. Recommended for all graduate students in geological sciences. Prerequisites, graduate standing and field geology. Lectures, M W 9:05. Laboratory, W 2-4:25. Messrs. Philbrick and Kiersch. Not offered in 1969-70.

Geobiology

Paleontology and Stratigraphy

471. INVERTEBRATE PALEONTOLOGY

Fall term. Credit four hours. For those interested in fossil evidence of the development of organisms. Prerequisite, Geology 102; recommended, invertebrate zoology. Lectures, T Th 10:10. Laboratory, W Th 2-4:25. Mr. Wells.

Paleobiology and classification of important fossil invertebrates.

472. PRINCIPLES OF HISTORIC GEOLOGY

Spring term. Credit four hours. Prerequisites, Geology 322 and 471. Lectures, T Th 10:10. Laboratory, W 2-4:25, and additional assigned problems. Mr. Wells.

Application of geologic principles to interpretation of earth history: development of the geologic column; geochronology and geochronometry; correlation and the zone concept; sedimentary environments and provinces; geosynclines and platforms; problems of the Pre-Cambrian and continental evolution.

571. STRATIGRAPHY: PALEOZOIC

Fall term. Credit three hours. Offered in alternate years. Prerequisite, Geology 472. Lectures, T Th 9:05 and W 7:30 P.M. Mr. Wells.

Principles of stratigraphy developed by detailed study of selected American and European systemic examples

572. STRATIGRAPHY: MESOZOIC AND CENOZOIC

Spring term. Credit three hours. Prerequisite, Geology 472. Lectures, T W Th 9:05. Mr. Wells.

Principles of stratigraphy developed by detailed study of selected American and European systemic examples.

671. MICROPALAEONTOLOGY

Spring term. Credit two hours. Prerequisite, Geology 472, 572. Lecture, W 9:05. Laboratory, W 2-4:25, and additional assigned problems. Staff.

Microfossils, chiefly Foraminifera.

672. STRATIGRAPHY OF NEW YORK STATE

Spring term. Credit three hours. Offered in alternate years. Prerequisite, Geology 571. Lectures, T Th 12:20 early in the term, followed by all-day and weekend field trips. Mr. Wells.

The classic Paleozoic sections of New York studied through lectures, readings, and field observation.

Seminars and Special Work

490. SENIOR THESIS

Either term. Credit one hour. Staff.

673. SEMINAR IN THE HISTORY OF GEOLOGY

Fall term. Credit two hours. Hours to be arranged. Mr. Wells.

Part of the graduate program in the history of science.

SEMINAR IN GEOLOGICAL SCIENCES

No credit. For majors and required of graduate students, but open to all who are interested. T 4:45. Staff and visiting lecturers.

Reports and discussion of current research in the geological sciences.

690. SPECIAL WORK

Throughout the year. Credit two hours a term. Prerequisite, consent of the instructor. Staff.

Advanced work on original investigations in geological sciences on the graduate level.

690-a. Analytical geochemistry, crystallography, and mineralogy. Mr. Chang.

690-b. Petrology and geochemistry of metamorphic and igneous rocks, associated metallic minerals. Mr. Bonnicksen.

690-c. Coastal geomorphology and Pleistocene geology. Mr. Bloom.

690-d. Engineering geology, geomechanics, and hydrogeology. Mr. Kiersch.

690-e. Seismology, crustal and marine geophysics, heat flow. Staff.

690-f. Invertebrate paleontology and paleoecology. Mr. Wells.

690-g. Sedimentology and primary structures.

Fall term. Credit one hour. Hours to be arranged. Special lecture seminar by Mr. E. D. McKee.

690-h. Physical and engineering geology, water resources. Mr. Philbrick.

690-i. Mineral deposits and resources, exploration geophysics. Mr. Clark.

GERMAN LITERATURE

Mr. H. Deinert, Chairman; Messrs. E. A. Blackall, D. Connor, J. B. Dallett, and staff.

For complete course listings and for details of the major, see the heading "German" under *Modern Foreign Languages and Literatures*.

GOVERNMENT

Mr. A. P. Sindler, Chairman; Messrs. B. R. Anderson, D. E. Ashford, W. F. Berns, A. D. Bloom, M. J. Brenner, H. W. Briggs, W. J. Dannhauser, A. T. Dotson, M. Einaudi, M. Esman, A. Hacker, R. I. Hofferbert, G. McT. Kahin, E. G. Kenworthy, A. J. Milnor, D. P. Mazingo, S. Muller, C. Rossiter, A. W. Rovine, M. Rush, P. Sharfman, A. Shulsky.

For a major in government the following courses must be completed: (1) Government 101, Government 104, and Government 203; (2) a minimum of twenty-four additional hours in the Department numbered 300 or above; (3) in related subjects, a minimum of twelve hours selected with the approval of the adviser from courses numbered 300 or above in anthropology, economics, history, philosophy, and sociology. Of the related hours, at least six must be in history.

Juniors and seniors majoring in the Department of Government who have superior grade records may apply for supervised study in government with a particular instructor, whose consent is required. See the description for Government 498 and 499 (Supervised Study).

THE HONORS PROGRAM. Candidates for the degree of Bachelor of Arts with Honors in Government will complete Government 101, 104, 203, and a minimum of twenty-four additional hours of work in the Department, including Government 492, 493, and 494, as well as twelve hours in related subjects.

Students seeking admission to the Department's Honors program must file applications on forms obtainable from the departmental secretary by November 15 of their junior year. Applications should be submitted only by students who have a cumulative average of B+ or better in all courses completed in the Department, or who can present evidence of exceptional promise. A description of the Honors Program follows the list of undergraduate courses, p. 151.

DISTRIBUTION REQUIREMENT. The Distribution requirement in social sciences is satisfied in government by taking two of the following three courses: Government 101, 104, and 203.

Introductory Courses

101. AMERICAN GOVERNMENT

Fall term. Credit three hours. Open to all students (with first preference for students in the College of Arts and Sciences). Lectures, T Th 1:25. Discussion

sections, Th 2:30; F 10:10, 11:15, 1:25, 2:30; S 10:10, 11:15. Messrs. Berns, Hacker, and staff.

A general introduction to American national government and politics.

104. COMPARATIVE GOVERNMENT

Spring term. Credit three hours. Open to all students. Lectures, T Th 2:30. Discussion sections, Th 3:35; F 10:10, 11:15, 1:25, 2:30; S 10:10, 11:15. Mr. Brenner.

A comparative study of major contemporary political movements and of governmental institutions and processes in Great Britain, France, Germany, Russia, as well as in some of the newly emerging countries.

203. INTRODUCTION TO POLITICAL THEORY

Fall term. Credit three hours. Open to all students. Government 101 and 104 are ordinarily taken prior to Government 203. Lectures, M W 11:15. Discussion sections to be arranged. Mr. Dannhauser.

A survey of the development of Western political theory from Plato to the present. Readings from the work of the major theorists and an examination of the relevance of their ideas to contemporary politics will be stressed.

FRESHMAN SEMINARS

As part of the Freshman Humanities Program, the Department of Government will offer the following two courses. Since they are equivalents of Government 101 and 104 they may be counted toward the major.

101S. AMERICAN GOVERNMENT

Spring term. Credit three hours.

A seminar version of Government 101. (See above, or see Freshman Humanities Program, page 36.)

104S. COMPARATIVE GOVERNMENT

Fall term. Credit three hours.

A seminar version of Government 104. (See above, or see Freshman Humanities Program, page 36.)

MAJOR SEMINARS

300. MAJOR SEMINARS

Either term. Credit four hours. Hours to be arranged. Messrs. Anderson, Berns, Brenner, Dannhauser, Kenworthy, Mazingo, Rossiter, Rovine, Sharfman, and Shulsky.

Every major in the Department is encouraged to take at least one major seminar during his junior and senior years. The topics of the seminars and the names of the professors offering them each semester will be announced prior to the registration period. Majors should, when registering with their advisers, indicate their preferential choices among the seminars being offered. Nonmajors may be admitted as space is available and should apply through the Department's secretary.

American Government and Institutions

Prerequisite for all courses in this section, Government 101, or consent of the instructor, unless the course description indicates otherwise. Open to sophomores, juniors, and seniors unless specified otherwise.

312. URBAN POLITICS

Spring term. Credit four hours. M W F 1:25.

Analysis of relationships between governmental activities and political power, making use of systematic studies of selected problems in large urban centers and their suburban satellites.

313. AMERICAN CONSTITUTIONAL LAW

Fall term. Credit four hours. Open to juniors and seniors only. M W F 10:10. Mr. Berns.

Analysis of the role of the Supreme Court and of the constitutional law it expounds. The course will be conducted through lectures and discussion of assigned cases.

[314. POLITICS AND SOCIETY]

Spring term. Credit four hours. T Th S 11:15. Mr. Hacker. Not offered in 1969-70.

315. INTEREST GROUPS AND INFORMAL REPRESENTATION IN AMERICAN POLITICS

Spring term. Credit four hours. M W F 11:15. Mr. Milnor.

Role of groups in the Congress and bureaucracy. Special attention to the limits of the group system, to the group system and social reform, and to the problems of representation for the poor.

316. THE AMERICAN PRESIDENCY

Spring term. Credit four hours. No prerequisite; Government 101 and History 215-216 recommended. T Th S 10:10.

Analysis of the office and powers of the President, with emphasis on his activities as administrator, diplomat, commander, legislator, politician, and head of state. The lives and accomplishments of the important Presidents are studied at length.

317. AMERICAN POLITICAL PARTIES

Fall term. Credit four hours. M W F 11:15. Mr. Sindler.

The nature and operation of American national and state party systems and politics, related to the broad setting of the governmental system and prevailing political values.

318. THE AMERICAN CONGRESS

Fall term. Credit four hours. M W 2:30-3:45. Mr. Milnor.

An intensive study of politics and policy formation in Congress. Special emphasis on the problems of the representative assembly in the twentieth century.

[320. MINORITY GROUP POLITICS]

Spring term. Credit four hours. M W F 10:10. Mr. Sindler. Not offered in 1969-70.

323. PUBLIC ADMINISTRATION: THE FOURTH BRANCH

Fall term. Credit four hours. M W F 9:05. Mr. Dotson.

An examination of the national administrative branch, including the Executive Office of the President, departments, regulatory commissions, government corporations, and other agencies. Particular attention will be given to the constitutional and political problems which result from the rise of administrative power.

325. PUBLIC POLICY AND AMERICAN STATE POLITICS

Fall term. Credit four hours. T Th 8:45-9:55. Mr. Hofferbert.

A study of the processes of public policy formation in the fifty states. The relevance of state government to American life is examined with special attention given to the relationships between the social setting, patterns of partisanship, and governmental processes of the states.

326. POLITICS AND POLICY MAKING IN THE AMERICAN COMMUNITY

Spring term. Credit four hours. M W 8:45-9:55. Mr. Hofferbert.

An examination of the nature of policies formulated by local governments and how they affect the lives of people in American communities. Special attention will be given to the processes of political decision making in communities of varying size and social composition.

Comparative Government

Prerequisite for all courses in this section, Government 104, or consent of the instructor, unless course description indicates otherwise. Open to sophomores, juniors, and seniors unless specified otherwise.

333. GOVERNMENT AND POLITICS OF THE SOVIET UNION

Fall term. Credit four hours. Open to juniors and seniors only. M W 2:30-4. Mr. Rush.

A focus on the politics of the top leaders, the institutions through which they operate, and the impact of their policies on the Soviet people. Emphasis also on phases in the development of the Soviet system and on the ways in which the Soviet Union served as the prototype of all subsequent Communist states, as well as on the variant forms that have appeared in other states.

[336. POLITICAL ATTITUDES AND PARTICIPATION]

Fall term. Credit four hours. Prerequisite, Government 101 or 104 or consent of the instructor. T Th 10:10 and a third hour to be arranged. Mr. Ashford. Not offered in 1969-70.

338. POLITICS AND MODERNIZATION

Spring term. Credit four hours. Open to juniors and seniors only. M W F 10:10. Mr. Dotson.

A comparative study of the political development of nations. Particular attention is given to cases in Southeast Asia, South Asia, West Africa, and Latin America. The political implications of the growing gap between advanced and backward states is examined critically.

340. GOVERNMENT AND POLITICS OF LATIN AMERICA

Fall term. Credit four hours. T Th 2:30-4. Mr. Kenworthy.

An introduction to the national politics of the larger nations in recent decades, emphasizing the impact of social and economic changes—international as well as domestic—upon them.

341. CONSTITUTIONAL GOVERNMENT IN EUROPE

Fall term. Credit four hours. Open to juniors and seniors only. T Th S 9:05.

342. GOVERNMENT AND POLITICS OF FRANCE AND BRITAIN

Fall term. Credit four hours. T Th S 10:10. Mr. Brenner.

An examination of the institutions and practices of the French and British political systems in the context of the issues and problems characteristic of advanced industrial societies.

[343. GOVERNMENT AND POLITICS IN THE COMMONWEALTH]

Spring term. Credit four hours. T Th 2:30-4. Mr. Anderson. Not offered in 1969-70.

344. GOVERNMENT AND POLITICS OF SOUTHEAST ASIA

Fall term. Credit four hours. T Th 2:30-4. Mr. Anderson.

Analysis of the organization and functioning of the political systems of Southeast Asia, with special attention to the problems of postcolonial social and political development.

347. CHINESE GOVERNMENT AND POLITICS

Fall term. Credit four hours. T Th S 11:15.

General introduction to the politics of modern China with particular emphasis on the political processes of the People's Republic of China.

349. POLITICAL ROLE OF THE MILITARY

Spring term. Credit four hours. M W 2:30-3:45. Mr. Anderson.

Comparative study of selected modern states and types of political systems in which the military have played a major role in domestic politics. Attention will be given to the social and ideological character of the "politicized" military and various forms of military government.

350. COMPARATIVE REVOLUTIONS

Fall term. Credit four hours. T Th 1:25-3. Mr. Mozingo.

An analysis of major revolutionary movements since World War II (China, Indonesia, Cuba, Algeria, Vietnam); their social-political origins, ideology, and organization; with special emphasis on contrasting strategies and roads to power.

442. POLITICAL AND ECONOMIC CHANGE IN CONTEMPORARY EUROPE

Spring term. Credit four hours. Open to juniors and seniors only. M W 2:30-4. Mr. Einaudi.

Emphasis will be placed on the key manifestations of change since the war. The crisis of parties and of social and political institutions. New instruments of public policy. The varieties of public corporations and of planning agencies. The social and technological revolutions and private enterprise. The search for new dimensions of government: regionalism and the supra-national communities.

Political Theory

Prerequisite for all courses in this section, Government 203, or consent of the instructor, unless course description indicates otherwise. Open to sophomores, juniors, and seniors unless specified otherwise.

[351. DEVELOPMENT OF MODERN POLITICAL THOUGHT]

Spring term. Credit four hours. Open to juniors and seniors only. T Th S 11:15. Mr. Einaudi. Not offered in 1969-70.

[353. THEORETICAL ROOTS OF MODERN POLITICS]

Spring term. Credit four hours. M W F 9:05. Mr. Dannhauser. Not offered in 1969-70.

355. AMERICAN POLITICAL THOUGHT

Fall term. Credit four hours. Open to juniors and seniors only. Prerequisite, Government 101, Government 203, and History 215, or consent of the instructor. T Th 1:25-3. Mr. Rossiter.

Survey of the development of American political thought, with emphasis on the origins and uses of ideas. Other kinds of thought—constitutional, social, religious, economic, educational, cultural—are considered in their relations to political thought.

462. ORIGINS OF WESTERN POLITICAL THOUGHT

Spring term. Credit four hours. M W F 12:20. Mr. Shulsky.

A survey of the classical political teachings in their development from the pre-Socratics through Greek and Roman antiquity and in their transformation by the revealed religions.

[464. BASIC PROBLEMS IN POLITICAL THEORY]

Spring term. Credit four hours. Open to juniors and seniors only, with the consent of the instructor. T Th 2:30-4:20. Mr. Berns. Not offered in 1969-70.

International Relations

Note: all courses in this section are open, without prerequisites, to sophomores, juniors, and seniors, unless indicated otherwise.

334. FOREIGN POLICY OF THE U.S.S.R.

Spring term. Credit four hours. Open to juniors and seniors only. Prerequisite, Government 333 or Government 372. M W F 12:20. Mr. Rush.

The evolution of Soviet foreign policy since 1917, and how the revolution affected the international system and was, in turn, modified by it. Considerable attention will be given to the response of leaders to crucial events, such as the coming of the Nazis to power and the advent of nuclear weapons, and to the origins and prospects of the Cold War.

372. INTERNATIONAL RELATIONS

Spring term. Credit four hours. M W F 10:10. Mr. Sharfman.

An analysis of the basic facts, configurations, issues, practices, and problems which characterize contemporary international politics, and an introduction to the concepts and methods used for such analysis.

375. CONTEMPORARY AMERICAN FOREIGN POLICY

Spring term. Credit four hours. M W F 12:20. Mr. Sharfman.

An analysis of general principles, particular decisions and problems, and their interrelation. The frame of reference will be the period since 1945.

377. THE UNITED STATES AND ASIA

Spring term. Credit four hours. M W F 9:05. Mr. Kahin.

An analysis of the relations of the United States with the major states of Asia and with those smaller countries (especially Vietnam) with which it is particularly concerned; attention is also given to the relationship of American policy to the Asian policies of France, Great Britain, and Soviet Russia.

381. INTERNATIONAL ORGANIZATION

Fall term. Credit four hours. M W F 9:05. Mr. Briggs.

An analysis of some international governmental procedures and institutions. Particular attention will be given to the background, organization, and operation of the United Nations, with emphasis on political and legal problems.

383. INTERNATIONAL LAW AND WAR

Fall term. Credit four hours. M W 2:30-3:45. Mr. Rovine.

The role of international law and organization in creating minimum order in international relations; laws of war and neutrality and efforts to minimize resort to force and international armed conflict.

384. THE UNITED NATIONS AND PEACEKEEPING

Spring term. Credit four hours. M W 2:30-3:45. Mr. Rovine.

A history and analysis of UN efforts to maintain international peace and security. Emphasis on the politics, processes, and place in the international system of UN peacekeeping forces, and, within that context, on the UN decision making process.

471-472. INTERNATIONAL LAW

Throughout the year. Credit four hours a term. Open to juniors and seniors only. M W F 11:15. Mr. Briggs.

A systematic study of the nature, development, and judicial application of international law. Attention will be given to the role of law in the relations of States. Cases, documentary analysis, and discussions.

478. THE FOREIGN POLICY OF CHINA

Spring term. Credit four hours. Open to juniors and seniors only. T Th 2:30-4. Mr. Mozingo.

An analysis of Chinese concepts of foreign relations and the policy making process in the People's Republic of China. Emphasis will be placed on such topics as the contemporary Chinese view of their position in the international community and a comparison of the making and implementation of contemporary Chinese policies with respect to such areas as the Soviet bloc, Afro-Asian countries, and the West.

The Honors Program

The Honors Program provides three semesters of intensive and supervised study for government majors who have demonstrated their potentialities for advanced work in the field. An average of B+ in government courses is the normal requirement for admission to the Program. Prospective applicants are encouraged to take a Government 300 Seminar in the fall semester of their junior year. Applications should be submitted to the Department by November 15. Those accepted will have their academic programs reviewed to ensure that they have done sufficient course work in each of the general areas offered by the Department.

(1) *The Junior Honors Seminar* (Government 492: spring term, credit four hours) reviews the various methods and approaches comprising the study of government. Over the summer, members of the Program are assigned reading and write papers which are mailed back to Ithaca.

(2) *Senior Tutorials* (Government 493: fall term, credit four hours) involve weekly sessions with professors specializing in fields of the student's interests.

The tutorials call for periodic papers and intensive reading. During this semester the student is also expected to draw up preliminary plans for his thesis.

(3) *The Honors Thesis* (Government 494: spring term, credit eight hours) is the major academic obligation undertaken by the student during his final semester at the University. A first draft is due at the end of spring vacation; and the final thesis must be submitted by May 1. Theses normally run to about seventy-five pages.

Degrees with *cum laude*, *magna cum laude*, or *summa cum laude* designations in government are recommended for students who successfully complete the Honors Program.

Supervised Study

Juniors and seniors majoring in government who have superior grade records may apply for supervised study in government with a particular instructor. The applicant must present a well defined program of study that cannot be satisfied by the taking of regular courses. Emphasis will be placed on the capacity to subject a body of related readings to analysis and criticism. The consent of the instructor is required.

498. READINGS

Either term. Credit two hours. Staff.

499. READINGS

Either term. Credit four hours. Staff.

Graduate Seminars

For complete descriptions of graduate courses see the *Announcement of the Graduate School: Social Sciences*.

FIELD PROSEMINARS

Each proseminar presents an overview of a subfield of the discipline, with special attention to persistent and current substantive concerns and analytic methods characteristic of the subfield.

501. PROSEMINAR IN CONTEMPORARY POLITICAL INQUIRY

Fall term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Mr. Hofferbert.

503. PROSEMINAR IN AMERICAN GOVERNMENT

Spring term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Mr. Milnor.

505. PROSEMINAR IN COMPARATIVE GOVERNMENT

Fall term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Mr. Brenner.

507. PROSEMINAR IN POLITICAL THEORY

Spring term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Mr. Dannhauser.

509. PROSEMINAR IN INTERNATIONAL RELATIONS

Fall term. Credit four hours. Open to graduate students. Prerequisite for seniors, Government 372. Hours to be arranged. Mr. Sharfman.

AMERICAN GOVERNMENT

[511. SEMINAR IN AMERICAN POLITICAL PARTIES AND ELECTIONS]

Not offered in 1969-70.

514. SEMINAR IN AMERICAN URBAN POLITICS

Fall term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged.

516. SEMINAR IN AMERICAN CONSTITUTIONAL LAW AND JURISPRUDENCE

Spring term. Credit four hours. Open to graduate students. Prerequisite for seniors, Government 313. Hours to be arranged. Mr. Berns.

521. SEMINAR IN PROBLEMS OF PUBLIC ADMINISTRATION

Fall term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Mr. Dotson.

[527. SEMINAR IN AMERICAN POLITICAL INSTITUTIONS]

Not offered in 1969-70.

528. SEMINAR IN AMERICAN POLITICAL THOUGHT

Spring term. Credit four hours. Open only to graduate students. Hours to be arranged. Mr. Rossiter.

532. SEMINAR IN AMERICAN STATE AND LOCAL POLITICS

Spring term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Mr. Hofferbert.

COMPARATIVE GOVERNMENT

534. SEMINAR IN THE POLITICS OF THE SOVIET UNION

Fall term. Credit four hours. Open to graduate students. Prerequisites for seniors, Government 333. Hours to be arranged. Mr. Rush.

535. SEMINAR IN PROBLEMS OF POLITICAL SUCCESSION

Spring term. Credit four hours. Open to graduate students. Prerequisites for seniors, Government 333 or 347. Hours to be arranged. Mr. Rush.

[537. SEMINAR IN POLITICAL CHANGE AND THE DEVELOPMENT PROCESS]

(Also Business and Public Administration 661, Graduate School of Business and Public Administration)

Not offered in 1969-70.

[538. SEMINAR IN ADMINISTRATION AND DEVELOPMENT]

(Also Business and Public Administration 662, Graduate School of Business and Public Administration)

Not offered in 1969-70.

154 GOVERNMENT

540. SEMINAR IN LATIN AMERICAN POLITICS

Spring term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Mr. Kenworthy.

541. SEMINAR IN COMPARATIVE POLITICAL PARTIES

Fall term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Mr. Milnor.

542. SEMINAR IN POLITICAL AND ECONOMIC CHANGE IN CONTEMPORARY EUROPE

Spring term. Credit four hours. Open to graduate students only. Hours to be arranged. Mr. Einaudi.

[545. SEMINAR IN IDEOLOGY AND POLITICAL CHANGE]

(Also Business and Public Administration 630, Graduate School of Business and Public Administration)

Not offered in 1969-70.

[546. SEMINAR IN THE ADMINISTRATIVE PROCESS]

Not offered in 1969-70.

547. SEMINAR IN THE POLITICS OF CHINA

Spring term. Credit four hours. Open to graduate students. Prerequisite for seniors, Government 347. Hours to be arranged.

[548. SEMINAR IN COMPARATIVE COMMUNISM]

Not offered in 1969-70.

550. SEMINAR IN POLITICAL ANTHROPOLOGY: SOCIAL STRUCTURE AND POLITICS

(Also Anthropology 528)

Spring term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Messrs. Anderson and Siegel.

POLITICAL THEORY

[555. SEMINAR IN POLITICAL THEORY]

Not offered in 1969-70.

556. SEMINAR IN POLITICAL THEORY

Fall term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Mr. Shulsky.

[558. SEMINAR IN MODERN POLITICAL THEORY]

Not offered in 1969-70.

[559. SEMINAR IN MODERN POLITICAL THEORY]

Not offered in 1969-70.

[562. SEMINAR IN POLITICAL THEORY]

Not offered in 1969-70.

INTERNATIONAL RELATIONS

575. SEMINAR IN INTERNATIONAL ORGANIZATION AND RELATIONS

Fall term. Credit four hours. Open to graduate students and qualified seniors by consent of the instructor. Hours to be arranged. Mr. Rovine.

576. SEMINAR IN INTERNATIONAL LAW AND INTERNATIONAL ORGANIZATION

Spring term. Credit four hours. Open to graduate students and law students only. Hours to be arranged. Mr. Briggs.

577. SEMINAR IN THE INTERNATIONAL RELATIONS OF ASIA

Fall term. Credit four hours. Open to graduate students. Prerequisite for seniors, Government 344, 377, or 478. Hours to be arranged. Mr. Kahin.

583. SEMINAR IN COMMUNIST CHINA IN INTERNATIONAL POLITICS

Fall term. Credit four hours. Open to graduate students. Prerequisite for seniors, Government 478. Hours to be arranged. Mr. Mozingo.

644. SEMINAR IN POLITICAL PROBLEMS OF SOUTHEAST ASIA

Spring term. Credit four hours. Open to graduate students. Prerequisite for seniors, Government 344. Hours to be arranged. Mr. Kahin.

HISTORY

Mr. W. F. LaFeber, Chairman; Messrs. K. Biggerstaff, J. F. Boshier, D. Davidson, E. W. Fox, P. W. Gates, H. Guerlack, D. G. E. Hall, C. Holmes, J. J. John, D. Kagan, M. Kammen, H. Koenigsberger, D. LaCapra, J. E. Martin, C. A. Peterson, W. M. Pintner, R. Polenberg, C. Rossiter, J. Silbey, J. M. Smith, F. Somkin, B. Tierney, M. Walker, L. P. Williams, and O. W. Wolters.

For admission to the history major a student must have completed an Introduction to Western Civilization, and have earned grades of C or better in this and in any other history courses taken. Students who have completed only the first semester of the Introduction to Western Civilization, with a grade of C or better, may be provisionally admitted to the major. Prospective majors should apply for admission at the Department of History office.

In fulfillment of the major requirement a student must take twenty-eight hours of history courses numbered 200 or above. Of the twenty-eight hours, sixteen must be in courses numbered above 330, and, of these sixteen, eight must be in one particular field of history (e.g., American, ancient, Latin American, early modern European). To complete the major a student must also take two courses numbered 300 or above offered by other departments that relate to his eight-hour concentration in one particular field of history.

THE HONORS PROGRAM. Candidates for the degree of Bachelor of Arts with Honors in History will consult with Mr. Fox in the spring of

1969 or Mr. Kammen in the fall of 1969, and enroll in the Honors program. (A description of the Honors program follows the list of undergraduate courses.)

DISTRIBUTION REQUIREMENT. The Distribution requirement in History is satisfied by any year course in history from History 105-106 to History 323-324 inclusive, and the year-long Greek Civilization Seminar of the Six-Year Ph.D. Program.

105-106. INTRODUCTION TO WESTERN CIVILIZATION

Throughout the year. Credit three hours a term. For freshmen and sophomores; open to juniors and seniors by permission only. First term prerequisite to second except by permission. M W (F) 9:05. Mr. Williams and assistants.

A survey of European history since antiquity. Attention is given equally to the major political and social developments and to the intellectual heritage of the West. A considerable portion of the reading is in contemporary sources.

Note: Freshmen may count either term or both toward satisfaction of the Freshman Humanities requirement. (For description of the Freshman Humanities program see page 36.)

215-216. AMERICAN HISTORY

Throughout the year. Credit three hours a term. Either term of the course may be taken separately. T Th S 9:05. Messrs. Kammen, LaFeber, Martin, Polenberg and staff.

Several major topics will be considered each term, and different modes of historical inquiry will be used: political, constitutional, diplomatic, economic, social, and intellectual. A primary purpose will be to give the student opportunities to make his own historical judgments and analyze those made by others. These aims will be pursued largely through weekly seminar work and frequent short essays.

Note: Freshmen may count either term or both toward satisfaction of the Freshman Humanities requirement. (For description of the Freshman Humanities program see page 37.)

301-302. ANCIENT HISTORY

Throughout the year. Credit three hours a term. Open to sophomores. History 301 is not prerequisite to History 302. M W F 11:15. Mr. Kagan.

A survey of ancient history from the beginnings of civilization in the valleys of the Near East to the decline of the Roman Empire. Two lectures and one discussion period each week.

303-304. MEDIEVAL HISTORY

Throughout the year. Credit three hours a term. Open to sophomores. History 303 is not prerequisite to History 304. Fall term, M W F 12:20. Mr. John. Spring term, T Th S 10:10. Mr. Tierney.

A survey of the main trends of political, economic, intellectual, and religious development in Europe from the fourth to the twelfth century in the fall term, and from the twelfth to the fifteenth century in the spring term.

307-308. ENGLISH HISTORY FROM ANGLO-SAXON TIMES TO THE PRESENT

Throughout the year. Credit three hours a term. Open to sophomores. Course 307 is not prerequisite to 308. T Th S 11:15. Mr. Holmes.

Traces the growth of government, economic life, religion, the arts, and society among the English people. Illustrates in the history of one nation some of the principal developments of Western civilization since early modern times, such as the nation-state, the late Renaissance, the industrial revolution, the overseas empire, and state socialism. Some of the written work is designed to give elementary training in the interpretation of documentary evidence. Work for the first term ends with the civil wars of the seventeenth century.

309. INTRODUCTION TO RUSSIAN HISTORY

Fall term. Credit three hours. Open to sophomores. M W F 9:05. Mr. Pintner.

A survey from the earliest times until the present day. The origin and development of the autocratic state, its relationship to the major segments of the population, and the unique features of Russian culture are stressed.

310. MAJOR PROBLEMS IN RUSSIAN HISTORY

Spring term. Credit four hours. Open to sophomores. History 309 is desirable but not a prerequisite for students willing to do additional background reading. M W F 9:05. Mr. Pintner.

An introductory course, using a topical approach. Important problems of political, cultural, social, and economic history will be studied in some detail using primary sources and specialized secondary works. Written work and discussion sections will be an important part of the course.

311-312. SCIENCE IN WESTERN CIVILIZATION

Throughout the year. Credit three hours a term. Open to sophomores. Prerequisite, one year of college science. History 311 or consent of the instructor prerequisite to History 312. M W F 10:10. Mr. Williams.

A survey of the development of science in its relation to the main currents of European and American civilization from classical antiquity to the present day.

319. LATIN AMERICAN HISTORY IN THE COLONIAL PERIOD

Fall term. Credit three hours. Open to sophomores. M W F 9:05. Mr. Davidson.

A survey of the colonial period from the discovery of America to the wars of independence. Emphasis is placed on the development of imperial systems of Spain and Portugal; the relations of Indians, Africans, and Europeans in the formation of new societies; economic institutions; and cultural achievements.

320. LATIN AMERICAN HISTORY SINCE INDEPENDENCE

Spring term. Credit three hours. Open to sophomores. M W F 9:05. Mr. Davidson.

A survey of the nineteenth and twentieth centuries using a topical approach. Attention focuses on the creation of nation-states, economic and social change, intellectual life, and the varieties of reaction, reform, and revolution in the recent period.

323. HISTORY OF CHINESE CIVILIZATION PRIOR TO THE NINETEENTH CENTURY

Fall term. Credit three hours. Open to sophomores. T Th S 10:10. Mr. Peterson.

A rapid survey of Chinese history from the earliest times until the establishment of formal relations with the West.

324. HISTORY OF CHINESE CIVILIZATION: NINETEENTH AND TWENTIETH CENTURIES

Spring term. Credit three hours. History 323 not prerequisite to History 324. Open to sophomores. T Th S 10:10. Mr. Biggerstaff.

A detailed survey of the modernization of Chinese civilization under the impact of the West. After a brief examination of early nineteenth-century China, the Western political, economic, and ideological invasion is considered, followed by a more thorough study of the revolutionary changes that have culminated in the People's Republic.

401. SUPERVISED READING

Either term. Credit two hours. Open only to seniors with grades of B- or better in virtually all courses in the humanities and social sciences. Prerequisite: permission of the chairman of the Department.

402. SUPERVISED RESEARCH

Either term. Credit four hours. Prerequisite: permission of the chairman of the Department. Open only to seniors with grades of B- or better in virtually all courses in the humanities and social sciences.

431. THE ROMAN REPUBLIC, 133-30 B.C.

Fall term. Credit four hours. Prerequisite, History 302 or consent of the instructor. M W 3:35-5. Mr. Bernstein.

432. GREEK HISTORY, 500-336 B.C.

Spring term. Credit four hours. Prerequisite, History 301 or consent of the instructor. M W 3:35-5. Mr. Kagan.

[335. MEDIEVAL CULTURE, 400-1150]

Spring term. Credit four hours. Prerequisite, History 303 or consent of the instructor. T Th 1:25-2:40. Mr. John. Not offered in 1969-70.

[336. MEDIEVAL CULTURE, 1150-1300]

Spring term. Credit four hours. Prerequisite, History 304 or consent of the instructor. T Th 1:25-2:40. Mr. John. Not offered in 1969-70.

437. CHURCH AND STATE DURING THE MIDDLE AGES

Fall term. Credit four hours. Prerequisite, History 303-304 or consent of the instructor. T Th S 11:15. Mr. Tierney.

[438. FRANCE IN THE HIGH MIDDLE AGES]

Spring term. Credit four hours. Prerequisite, History 303-304 or consent of the instructor. T Th S 11:15. Mr. Tierney. Not offered in 1969-70.

341-342. EUROPE IN THE AGE OF THE RENAISSANCE, REFORMATION, AND COUNTER-REFORMATION

Throughout the year. Credit four hours a term. Prerequisite, six hours in European history or consent of the instructor. M W F 11:15. Mr. Koenigsberger.

343. EUROPE FROM LOUIS XIV TO THE FRENCH REVOLUTION, 1660-1789

Fall term. Credit four hours. T Th S 10:10. Mr. Bosher.

344. WAR, TRADE AND EMPIRE, 1648-1783

Spring term. Credit four hours. T Th S 10:10. Mr. Boshier.

European struggles for wealth and domination overseas.

442. CATHERINE DE MEDICI AND THE FRENCH WARS OF RELIGION

Spring term. Credit four hours. Prerequisite, six hours of European history and consent of the instructor. M W F 9:05. Mr. Koenigsberger.

444. THE AGE OF ENLIGHTENMENT

Spring term. Credit four hours. Prerequisite, six hours in European history. M W F 10:10. Mr. Guerlac.

A study of major currents of European thought from 1662 to 1789, with special attention to the views on nature, man, and society of such thinkers as Locke, Newton, Montesquieu, Voltaire, Buffon, Franklin and Condorcet. Lectures, discussion, and required term paper. A reading knowledge of French is advisable but not required.

[347. ENGLISH CONSTITUTIONAL HISTORY I: TO 1485]

Fall term. Credit four hours. Prerequisite, History 303-304, History 307, or consent of the instructor. T Th S 12:20. Mr. Tierney. Not offered in 1969-70.

[348. ENGLISH CONSTITUTIONAL HISTORY II: SINCE 1485]

Spring term. Credit four hours a term. Prerequisite, History 307-308, History 347 or consent of the instructor. T Th S 9:05. Not offered in 1969-70.

450. HISTORY OF ENGLAND IN THE NINETEENTH AND TWENTIETH CENTURIES

Fall term. Credit four hours. T Th S 9:05.

[351. EUROPE IN THE NINETEENTH CENTURY]

Fall term. Credit four hours. Prerequisite, History 106 or consent of the instructor. W F 1:25-3:20. Mr. Fox. Not offered in 1969-70.

[352. EUROPE IN THE TWENTIETH CENTURY]

Spring term. Credit four hours. Prerequisite, History 106 or 351, or consent of the instructor. W F 1:25-3:20. Mr. Fox. Not offered in 1969-70.

[551. EVOLUTION OF THE FRENCH REPUBLIC]

Spring term. Credit four hours. Open to juniors, seniors, and graduate students with the consent of the instructor. A reading knowledge of French is required. T Th 3:35-5:30. Mr. Fox. Not offered in 1969-70.

[553. THE EUROPEAN REVOLUTION, 1789-1848]

Fall term. Credit four hours. Open to seniors and graduate students with the consent of the instructor. A reading knowledge of French is required. T Th 3:35-5:30. Mr. Fox. Not offered in 1969-70.

353-354. EUROPEAN INTELLECTUAL HISTORY IN NINETEENTH AND TWENTIETH CENTURIES

Throughout the year. Credit four hours a term. Either term may be taken independently and without prerequisite. M W F 12:20. Mr. LaCapra.

355-356. MODERN GERMAN HISTORY

Throughout the year. Credit four hours a term. Either term may be taken independently and without prerequisite. T Th S 10:10.

In the fall term the period 1648-1848 will be treated; in the spring term, the period 1848 to the present.

[456. GERMAN PROBLEMS IN HISTORICAL PERSPECTIVE]

Spring term. Credit four hours. Prerequisite: History 355 or 356, or approval of the instructor. Th 1:25-3:20. Mr. Walker. Not offered in 1969-70.

[457. ENLIGHTENED ABSOLUTISM AND THE PEOPLE]

Spring term. Credit four hours. Prerequisite, History 343-344 or consent of the instructor and a reading knowledge of French. T Th S 12:20. Mr. Boshier. Not offered in 1969-70.

461. ECONOMIC AND SOCIAL HISTORY OF RUSSIA

Fall term. Credit four hours. Prerequisite, History 309 or consent of the instructor. M 1:25-2:15, W 1:25-3:20. Mr. Pintner.

Emphasizes the role of the peasantry throughout the entire course of Russian history, from the Kievan period to the present day. Special attention will be devoted to the various methods used by the state in the economic exploitation and political control of the population.

[462. HISTORY OF RUSSIAN FOREIGN RELATIONS FROM THE FIFTEENTH CENTURY]

Spring term. Credit four hours. Prerequisite, History 309 or permission of the instructor. M 1:25-2:15, W 1:25-3:20. Mr. Pintner. Not offered in 1969-70.

466. ORIGINS OF MODERN SCIENCE

Fall term. Credit four hours. Prerequisite, History 311 or consent of the instructor. Th 2:30-4:25. Another session to be arranged. Mr. Guerlac.

Science and pseudo-science in Graeco-Roman antiquity. Conducted, with occasional lectures, as a seminar open to undergraduates.

[467. INTELLECTUAL CURRENTS OF THE SEVENTEENTH CENTURY]

Spring term. Credit four hours. Prerequisite, History 311-312 or consent of the instructor. Mr. Guerlac. Not offered in 1969-70.

[371. COLONIZATION FROM ANTIQUITY UNTIL THE EIGHTEENTH CENTURY]

Fall term. Credit four hours. M W F 9:05. Mr. Kammen. Not offered in 1969-70.

372. THE COLONIAL PERIOD OF AMERICAN HISTORY, 1607-1763

Fall term. Credit four hours. M W F 9:05. Mr. Kammen.

The colonial origins of American society, with emphasis on the emergence of distinctive institutions, attitudes, and social patterns.

373-374. THE STRUCTURE OF AMERICAN POLITICAL HISTORY

Throughout the year. Credit four hours a term. History 373 is not a prerequisite to History 374. T Th S 10:10.

[470. THE UNITED STATES IN THE MIDDLE PERIOD, 1815-1850]

Fall term. Credit four hours. T Th 10:10. Mr. Silbey. Not offered in 1969-70.

471. PROBLEMS IN AMERICAN POLITICAL HISTORY

Fall term. Credit four hours. Prerequisite, History 215-216 and consent of the instructor. Hours to be arranged. Mr. Rossiter.

A study of American national development in such fields as politics, administration, law, education, culture, economics, technology, religion, and social relation from 1790-1860.

472. EUROPE AND THE ORIGINS OF AMERICAN CIVILIZATION

Spring term. Credit four hours. Enrollment limited to twenty juniors and seniors. T 1:25-3:20. Mr. Kammen.

A seminar concentrating on two objectives: a comparison of selected developments in Europe and America, 1550-1750, and an attempt to explain the origins of a unique American civilization and character.

473. AGE OF THE AMERICAN REVOLUTION, 1763-1783

Fall term. Credit four hours. M W F 1:25. Mr. Smith.

The transformation of the English colonies into the new American nation. The Old Colonial System and the new politics, the concepts of constitutionalism and sovereignty, the War for Independence, republicanism and democratic thought.

474. THE NEW NATION, 1783-1815

Spring term. Credit four hours. M W F 1:25. Mr. Smith.

[376. AMERICAN CULTURAL AND INTELLECTUAL HISTORY, 1600-1820]

Credit four hours. M W F 10:10. Not offered in 1969-70.

377. AMERICAN CULTURAL AND INTELLECTUAL HISTORY 1820-1890

Fall term. Credit four hours. No prerequisite, but some background in nineteenth-century history and literature is taken for granted. M W F 10:10. Mr. Somkin.

Topics include ante-bellum challenges to laissez-faire liberalism, romanticism in politics and culture, the impact of evolutionary thought, ferment and reorientation in philosophy and social theory.

378. AMERICAN CULTURAL AND INTELLECTUAL HISTORY, 1890 TO THE PRESENT

Spring term. Credit four hours. M W F 10:10. No prerequisite, but some background in twentieth-century history and literature is taken for granted, and it is recommended that History 377 be taken before History 378. Mr. Somkin.

Topics include the response to science and technology, the erosion of traditional liberalism, and the continuing search for a new synthesis.

475. AMERICAN HISTORIOGRAPHY IN THE MIDDLE PERIOD

Fall term. Credit four hours. W 1:25-3:20. Mr. Somkin.

The development of a sense of American history with special attention to the work of Bancroft and Hildreth.

476. PROBLEMS IN AMERICAN CULTURAL HISTORY

Spring term. Credit four hours. W 1:25-3:20. Mr. Somkin.

A seminar. An examination of public discourse in the period 1789-1860 with the aim of identifying key concepts and images relating to the national historical portrait.

[478. THE AMERICAN REFORM IMPULSE, 1800-1860]

Spring term. Credit four hours. Open to juniors and seniors with consent of instructor. M W F 1:25. Not offered in 1969-70.

SEMINAR IN AMERICAN STUDIES

(American Studies 401-402)

Either term. Mr. Elias.

379. AMERICAN HISTORY FROM 1890-1917

Fall term. Credit four hours. T Th S 10:10. Mr. McSeveney.

The social impact of urbanization and industrialization, the ideology of protest and reform, the labor movement and socialism, immigration and nativism, segregation and the ghetto, agrarian radicalism and the Populist movement, politics and social thought in the Progressive era, and World War I. Two lectures and one discussion period each week.

480. UNDERGRADUATE SEMINAR IN RECENT AMERICAN HISTORY

Spring term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Polenberg.

Topic for 1970: Radicalism and Reform from 1917-1960's.

380-381. RECENT AMERICAN HISTORY, 1917 TO THE PRESENT

Throughout the year. Credit four hours a term. T Th S 12:20. Mr. Polenberg.

[375. THE AMERICAN CIVIL WAR AND RECONSTRUCTION]

Spring term. Credit four hours. T Th S 10:10. Mr. Silbey. Not offered in 1969-70.

481-482. AMERICAN HISTORY: HISTORY OF THE WEST

Throughout the year. Credit four hours a term. First term not prerequisite to the second. M W F 12:20. Mr. Gates.

Western migration, Indian policies, internal improvements, transportation, agriculture, growth of democracy and nationalism, land problems, conservation, federal and state relations. The major part of the work will be a research paper.

383-384. HISTORY OF AMERICAN FOREIGN RELATIONS

Throughout the year. Credit four hours a term. T Th S 11:15. Mr. LaFeber.

A survey of American foreign policy, 1750 to the present. Special emphasis is placed on the domestic, economic, political, and social changes and how these changes influence the formulation of American foreign policy. The first semester covers the period to 1914. A term paper is optional for all students who receive a C or above on the six weeks' examination.

[385. PROBLEMS IN THE HISTORY OF THE OLD SOUTH, 1606-1860]

Fall term. Credit four hours. M W F 11:15. Mr. Martin. Not offered in 1969-70.

386. THE END OF THE OLD REGIME AND THE ORIGINS OF THE NEW SOUTH

Fall term. Credit four hours. M W F 11:15. Mr. Martin.

A survey of the economic, social, political, intellectual, and military history of the Confederacy; and an examination of life in the Southern states during Reconstruction.

387. THE SOUTH SINCE RECONSTRUCTION, 1877-1960.

Spring term. Credit four hours. M W F 11:15. Mr. Martin.

A survey of the major economic, political, social, and intellectual developments in the Southern states during the period. Special emphasis will be placed on the role of the South in the American nation, the "Second Reconstruction," and the significant contributions toward an understanding of the South made by its men of letters.

485. THE RISE OF THE URBAN SOUTH, 1820-1960

Fall term. Credit four hours. M 2:30-3:20; W 2:30-4:25. Mr. Martin.

Readings and discussions. A study of the founding and growth of cities and towns in the region. Topics of particular importance will be the evolution of an urban style of living, and the impact of continuing urbanization on the economy and class structure of the South, on state and local political institutions, and on Southern intellectual life and letters.

[486. THE STUDY OF THE SOUTH AS AN APPROACH TO AMERICAN HISTORY]

Spring term. Credit four hours. M 2:30-3:20; W 2:30-4:25. Mr. Martin. Not offered in 1969-70.

488. PROBLEMS IN THE HISTORY OF BRAZIL

Spring term. Credit four hours. Prerequisite, History 319-320 or consent of the instructor. M W F 11:15. Mr. Davidson.

A seminar discussion of certain themes of Brazilian history in the light of changing interpretations. Topics include the nature of the colonial experience, the transition to nationhood, race relations, slavery and abolition, modernization and nationalism. A paper is required.

[489. LATIN AMERICA IN THE ERA OF INDEPENDENCE]

Fall term. Credit four hours. Prerequisite, History 319 or 320 or consent of the instructor. A reading knowledge of Spanish or Portuguese is recommended. M W F 11:15. Mr. Davidson. Not offered in 1969-70.

492. CHINESE HISTORY: T'ANG AND SUNG PERIODS

Spring term. Credit four hours. Prerequisite, History 323 or consent of the instructor. T Th 1:25-3:20. Mr. Peterson.

Analytic study of the evolution of Chinese society between the seventh and thirteenth centuries.

593. MODERNIZATION OF CHINA

Spring term. Credit four hours. Open to graduate students and to seniors who have completed History 324 or its equivalent with a grade of B or better. M 3:35-5:30. Mr. Biggerstaff.

Seminar discussion of selected topics relating to the impact of Western civilization upon traditional China and the changes that occurred in China during the first half of the twentieth century.

[594. MODERNIZATION OF CHINA]

Spring term. Credit four hours. Prerequisite, History 593. M 3:35-5:30. Mr. Biggerstaff. Not offered in 1969-70.

495. SOUTHEAST ASIAN HISTORY TO THE FOURTEENTH CENTURY

Fall term. Credit four hours. T Th S 11:15. Mr. Wolters.

496. SOUTHEAST ASIAN HISTORY FROM THE FIFTEENTH CENTURY
Spring term. Credit four hours. Prerequisite, History 495 or consent of the instructor. T Th S 11:15. Mr. Wolters.

The Honors Program

Students wishing to enroll in the Honors program in history will consult with Mr. Fox in the spring of 1969 or Mr. Kammen in the fall of 1969. The minimum requirements for admission to candidacy for Honors are (1) a cumulative average of B- or better in all courses; (2) a cumulative average of B or better in courses in the humanities and social sciences; (3) enrollment and outstanding performance in at least one history course before the spring term of the sophomore year.

An Honors candidate will take the history proseminar (History 399) during the fall semester of his junior year. In the spring he will take at least one advanced history course entailing frequent discussions and considerable writing under supervision. During the fall term of his senior year the candidate will register for a four-hour course of supervised reading and research related to his Honors essay (History 499). During the spring term of his senior year the candidate will register for a four-hour course in order to complete and prepare to defend his Honors essay and his general work in History (History 500).

The text of the Honors essay may not exceed sixty pages except by permission of the chairman of the Honors committee and the student's adviser. Two copies will be due during the last week of April. One copy will be returned with the readers' comments. In May, each Honors candidate will be given a thirty-minute oral examination, administered by his major adviser and one or both of the essay readers. The examination will ordinarily be concerned with the broad field of the essay (e.g., Periclean Athens, seventeenth-century science, nineteenth-century France).

The purpose of the Honors program is to give unusually able students an opportunity to do independent work under close faculty supervision. The progression of special courses taken during the junior and senior years (from History 399 through 499) all may be counted toward the twenty-eight hours in history required of a major. Evidence to be considered in awarding the Bachelor of Arts with Honors in History will include (1) grades earned in all history and related courses; (2) readers' reports on the Honors essay; and (3) performance on the senior oral examination.

399. HONORS PROSEMINAR

Fall term. Credit three hours. Open only to juniors who have been accepted by the Department as candidates for Honors in history. Th 1:25-3:20. Mr. Kammen.

Historical criticism and historical composition from different kinds of evidence, methods of research, and modes of explanation, in preparation for further work in the Honors program.

499-500. HONORS GUIDANCE

Throughout the year. Credit four hours a term. Prerequisite, History 399.

Graduate Seminars

501. INTRODUCTION TO HISTORICAL THEORY AND PRACTICE

Fall term. Credit four hours. Required of all entering graduate students in history. Not open to undergraduates. T Th 3:35-5:30. Mr. Boshier.

Problems of historical thought, research, and writing as illustrated by historians representative of various cultures, periods, and schools. Intensive supervision in the preparation of a term paper.

511-512. SUPERVISED READING

Throughout the year. Credit four hours a term. For graduate students only. Hours to be arranged. Staff.

591. CHINESE HISTORIOGRAPHY AND SOURCE MATERIALS

Fall term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Peterson.

631-632. SEMINAR IN ANCIENT HISTORY

One or two terms. Credit four hours a term. Hours to be arranged. Mr. Kagan.

635-636. SEMINAR IN MEDIEVAL HISTORY

One or two terms. Credit four hours a term. Hours to be arranged. Mr. John.

637-638. SEMINAR IN MEDIEVAL HISTORY

One or two terms. Credit four hours a term. Hours to be arranged. Mr. Tierney.

639-640. SEMINAR IN LATIN PALEOGRAPHY

Throughout the year. Credit four hours a term. First term prerequisite to the second. Hours to be arranged. Mr. John.

641. EUROPEAN CITIES IN THE AGE OF THE RENAISSANCE AND THE BAROQUE

Fall term. Credit four hours. Hours to be arranged. Mr. Koenigsberger.

647-648. SEMINAR IN TUDOR AND STUART HISTORY

One or two terms. Credit four hours a term. Hours to be arranged. Mr. Holmes.

649-650. SEMINAR IN THE FRENCH REVOLUTION

One or two terms. Credit four hours a term. Hours to be arranged. Mr. Boshier.

[651-652. SEMINAR IN MODERN EUROPEAN HISTORY]

One or two terms. Credit four hours a term. Hours to be arranged. Mr. Fox. Not offered in 1969-70.

653-654. SEMINAR IN MODERN EUROPEAN INTELLECTUAL AND CULTURAL HISTORY

One or two terms. Credit four hours a term. Hours to be arranged. Mr. LaCapra.

657-658. SEMINAR IN MODERN GERMAN HISTORY

One or two terms. Credit four hours a term. Hours to be arranged.

661-662. SEMINAR IN RUSSIAN HISTORY

One or two terms. Credit four hours a term. Hours to be arranged. Mr. Pintner.

665-666. SEMINAR IN THE HISTORY OF EARLY MODERN SCIENCE
One or two terms. Credit four hours a term. Hours to be arranged. Mr. Guerlac.

667-668. SEMINAR IN THE HISTORY OF SCIENCE DURING THE NINETEENTH AND TWENTIETH CENTURIES
One or two terms. Credit four hours a term. Hours to be arranged. Mr. Williams.

669-670. SEMINAR IN THE HISTORY OF COLONIZATION AND COLONIAL DEVELOPMENT
One or two terms. Credit four hours a term. Hours to be arranged. Mr. Kammen.

671-672. SEMINAR IN EARLY AMERICAN HISTORY
One or two terms. Credit four hours. Hours to be arranged. Mr. Smith.

[673-674. SEMINAR IN AMERICAN POLITICAL HISTORY AND THE ANTEBELLUM PERIOD]
One or two terms. Credit four hours a term. Hours to be arranged. Mr. Silbey.
Not offered in 1969-70.

[675-676. SEMINAR IN AMERICAN CULTURAL AND INTELLECTUAL HISTORY]
One or two terms. Credit four hours a term. Hours to be arranged. Not offered in 1969-70.

679-680. SEMINAR IN RECENT AMERICAN HISTORY
One or two terms. Credit four hours a term. Hours to be arranged. Mr. Polenberg.

681-682. SEMINAR IN THE HISTORY OF THE AMERICAN WEST
One or two terms. Credit four hours a term. Hours to be arranged. Mr. Gates.

683-684. SEMINAR IN THE HISTORY OF AMERICAN FOREIGN RELATIONS
Throughout the year. Credit four hours a term. Hours to be arranged. Mr. LaFeber.

685-686. SEMINAR IN THE HISTORY OF THE AMERICAN SOUTH
One or two terms. Credit four hours a term. Hours to be arranged. Mr. Martin.

687-688. SEMINAR IN LATIN AMERICAN HISTORY
One or two terms. Credit four hours a term. Hours to be arranged. Mr. Davidson.

691-692. SEMINAR IN MEDIEVAL CHINESE HISTORY
One or two terms. Credit four hours a term. Hours to be arranged. Mr. Peterson.

693-694. SEMINAR IN MODERN CHINESE HISTORY
One or two terms. Credit four hours a term. Hours to be arranged. Mr. Biggerstaff.

695-696. SEMINAR IN SOUTHEAST ASIAN HISTORY

One or two terms. Credit four hours a term. Hours to be arranged. Mr. Wolters.

HISTORY OF ART

Mr. M. W. Young, Chairman; Mr. P. Barolsky, Mrs. LeGrace Benson, Messrs. T. M. Brown, R. G. Calkins, A. H. Detweiler, Mrs. Esther Dotson, Mr. S. W. Jacobs, Mrs. Ernestine King, Messrs. T. W. Leavitt, W. C. Lipke, S. J. O'Connor, A. S. Roe, K. L. Selig, F. O. Waage.

Students who wish to major in the history of art should plan to have completed two courses in the Department of the History of Art by the end of their sophomore year. Students who have taken only one course may petition to major in the Department if that course is at the 200 level or above and is completed with a grade of C or better. Students should also have completed the Distribution requirements, but exceptions will be considered upon petition to the Department Chairman at the time of application to the major.

In their junior and senior years, students who are majoring shall work closely with their major advisers to determine acceptable programs of courses in the major field. Normally the program will include at least thirty additional hours of courses, of which twenty-four should be at the 300 or 400 level, chosen from those listed below, and a minimum of two additional courses in the Department or a related area approved by the major adviser. Courses at the 200 or 300 level taken in the Department during the freshman or sophomore years may be counted toward the major, providing such courses are in addition to the two courses offered in satisfaction of the prerequisite to the major. Students who are majoring are encouraged to take studio courses in painting and sculpture offered by the Department of Fine Arts in the College of Architecture, Art, and Planning, but such courses will be considered electives and cannot count toward the basic thirty hours normally required in the major. However, those courses in architectural history taught in the College of Architecture and listed below can be counted toward the major requirement.

THE HONORS PROGRAM. A student who wishes to become a candidate for the degree of Bachelor of Arts with Honors in the History of Art may indicate his intention at any time during his junior year to the Department Chairman. In order to be eligible for the Honors program, the student must have a cumulative average of at least B- for courses in the Department of the History of Art. In his senior year he will include among the regular requirements Course 493-494, involving the preparation of a senior thesis under faculty supervision.

DISTRIBUTION REQUIREMENT. The Distribution requirement in Expressive Arts is satisfied by a combination of any two courses at the 200 or 300 level.

General Courses

The following courses do not have prerequisites and are designed to introduce students to the process of art history by means of a careful and systematic examination of a closely related body of visual material. The 200-level courses are open to freshmen; 300-level courses are open to sophomores and upper-classmen.

103. ANALYSIS OF WORKS OF ART

Either term. Credit four hours. M W F 9:05; 10:10; 11:15; 12:20; T Th S 9:05; 10:10; 11:15; 12:20. Staff.

An introduction to the problem of articulating the visual experience. Students will meet in small classes of approximately twenty for discussion and examination of works of art, largely through reproductions but with occasional museum study, in order to provide training in the techniques of visual analysis. Readings and a number of short papers will be assigned throughout the term, but emphasis will be placed on classroom participation.

Conceived as a supplement to the study of art history, the course will not, however, approach the works of art in the usual historical or chronological fashion. The course may also be regarded as of general interest, with application outside the field of art history.

Open to freshmen and sophomores only. Freshmen may count this course in partial fulfillment of the Freshman Humanities requirement. For description of the Freshman Humanities Program, see p. 37.

243. ITALIAN RENAISSANCE ART OF THE FIFTEENTH CENTURY

Fall term. Credit three hours. M W F 11:15. Mr. Roe.

The development of the early Renaissance style in sculpture, painting, and architecture during the fifteenth century. Major masters and monuments will be considered within the context of the historical and intellectual trends which established this period as an era of artistic transition. While the focus will be upon Florentine art, significant monuments in other areas of central and northern Italy will be discussed.

244. ITALIAN PAINTING OF THE SIXTEENTH CENTURY

Spring term. Credit three hours. M W F 11:15. Mr. Barolsky.

Beginning with a discussion of Leonardo's art, the course will attempt to define the major trends of style in sixteenth-century Italy. The art of Raphael, Michelangelo, Giorgione, Titian and others will be discussed in detail.

256. ART OF THE BAROQUE ERA

Spring term. Credit three hours. M W F 10:10. Mr. Roe.

The High Baroque style will be discussed, tracing its origins and development in Italy, its dissemination throughout western and northern Europe, to the era of the French dominance of European art established in the reign of Louis XIV. Major monuments of architecture and sculpture will be considered, as well as the works of the outstanding masters of the schools of painting of Italy, Spain, France, and the Netherlands.

262. EUROPEAN PAINTING OF THE NINETEENTH CENTURY

Spring term. Credit three hours. M W F 12:20. Mr. Brown.

A study of major trends in European painting from Goya to Cezanne. Emphasis will be upon French painting from the era of the French Revo-

lution to the post-Impressionists, but significant developments and major artistic personalities in other European countries will also be considered.

Formerly History of Art 362.

263. MODERN EUROPEAN PAINTING

Fall term. Credit three hours. M W F 12:20. Mr. Lipke.

A study of the major developments in European painting and new two-dimensional media from Cubism to the present day. While principal focus of the course will center upon such major figures as Matisse, Picasso, Kandinsky, Klee, and Mondrian, equal emphasis will be given to the new visual points of view which have emerged since World War II.

Formerly History of Art 363.

281. SELECTED TRADITIONS IN ASIAN ART

Spring term. Credit three hours. T Th S 10:10. Mr. O'Connor.

A consideration of some of the major works produced by Asian artists and of the religious and aesthetic principles which influenced their creation. Painting, sculpture, and architecture will be covered.

313. PREHISTORIC ART

Fall term. Credit four hours. M W F 9:05. Mr. Waage.

The evolution and diffusion of Stone Age art and artifacts in Eurasia and Africa will be presented so as to acquaint the student at the same time with the major aspects and problems of archaeological activity in general. The time span extends from the Lower Palaeolithic period to the Metals Age civilizations of the Near East.

314. PRIMITIVE ART: THE ART OF TRIBAL SOCIETIES

Spring term. Credit four hours. M W F 9:05. Mr. Waage.

The shaping and use of art forms to satisfy group needs in cultures where art was an indispensable element of everyday life. The lectures will cover the tribal arts of Africa: subjects for the term paper will involve also the primitive arts of Australia, the Pacific Islands, and North America.

ARCHITECTURE OF THE CLASSICAL WORLD

(Architecture 431, College of Architecture, Art, and Planning)

Fall term. Credit three hours. M W F 12:20. Mr. Detweiler.

See *Announcement of the College of Architecture, Art, and Planning*.

[331. ART OF THE MIDDLE AGES]

Fall term. Credit four hours. T Th S 9:05. Mr. Calkins. Not offered in 1969-70.

[332. ARCHITECTURE OF THE MIDDLE AGES]

(Also Architecture 433, College of Architecture, Art, and Planning)

Fall term. Credit four hours. T Th S 11:15. Mr. Calkins. Not offered in 1969-70.

341. FLEMISH ART

Spring term. Credit four hours. T Th S 11:15. Mr. Calkins.

An investigation of the specific contributions of Netherlandish panel painting and manuscript illumination in the formation of a Northern Renaissance style in the fifteenth and sixteenth centuries. Special attention will be given to such major artists as Robert Campin, Jan van Eyck, Roger van der Weyden, Jerome Bosch and Pieter Breughel.

[347. ART OF THE EARLY RENAISSANCE IN ITALY]

Fall term. Credit four hours. T Th S 9:05. Mr. Calkins. Not offered in 1969-70.

349. ITALIAN RENAISSANCE ARCHITECTURE

(Also Architecture 436, College of Architecture, Art, and Planning)

Spring term. Credit four hours. T Th S 9:05. Mr. Calkins.

A study of the major monuments of architecture in Italy in the fifteenth and sixteenth centuries. Special emphasis will be given to the works of Brunelleschi, Alberti, Bramante, Michelangelo and Palladio.

354. DUTCH PAINTING OF THE SEVENTEENTH CENTURY

Spring term. Credit four hours. M W F 10:10. Mr. Barolsky.

A study of Dutch painting in the principal schools of Holland, including Utrecht, Delft, Leiden, and Amsterdam. Particular emphasis will be placed on Rembrandt; Hals, Vermeer, Steen, Ruisdael, Van Goyen and others will be discussed.

357. EUROPEAN ART OF THE EIGHTEENTH CENTURY

Fall term. Credit four hours. T Th S 10:10. Mrs. Dotson.

A study of tradition, change, and revolution in the architecture, painting, sculpture, and minor arts of eighteenth-century Europe.

The course will be organized around a selected sequence of European centers where the various eighteenth-century styles underwent an especially brilliant, original, or influential development, and an effort will be made to relate these developments to the cultural background of the period and of these centers. Among the subjects to be discussed will be the contrasting late baroque styles of northern and southern Italy, Austria and the south German states, and England; the court art of France from the late years of Louis XIV until the French Revolution; the range of influences on art and art theory emanating from Rome; the art of revolutionary France; the "pre-romanticism" in England and Spain.

[365. MODERN SCULPTURE]

Spring term. Credit four hours. T Th S 10:10. Mr. Lipke. Not offered in 1969-70.

367. MODERN EUROPEAN ARCHITECTURE

(Also Architecture 439, College of Architecture, Art, and Planning)

Fall term. Credit four hours. M W F 11:15. Mr. Brown.

A survey of nineteenth- and twentieth-century architecture in Europe.

372. ROMANTICISM IN PAINTING

Spring term. Credit four hours. M W 9:05. Mr. Leavitt.

Painting and sculpture in Europe and America from 1760-1860 will be discussed in its relationship to the romantic movement in philosophy, literature, and other arts. Works by such artists as Gericault, Delacroix, Turner, and Allston will be examined in the light of the other significant movements of classicism and realism. Two lectures weekly plus arranged conferences on a required term paper.

[375. AMERICAN ART OF THE EIGHTEENTH AND NINETEENTH CENTURIES]

Spring term. Credit four hours. T Th S 11:15. Mr. Roe. Not offered in 1969-70.

376. MODERN AMERICAN ART

Fall term. Credit four hours. T Th S 11:15. Mrs. Benson.

Art in America since 1900 with particular emphasis on the works of the last three decades. While the course will deal extensively with painting, other visual arts such as graphics, sculpture, objects, environments, and light will receive considerable attention. There will be opportunities to deal with original works.

AMERICAN ARCHITECTURE

(Also Architecture 438, College of Architecture, Art, and Planning)

Spring term. Credit four hours. Mr. Jacobs.

Building in the United States from colonial times, with emphasis on the nineteenth and twentieth centuries.

380. COMPARATIVE GENRES IN EAST-WEST ART

Spring term. Credit four hours. No prerequisite, but it is assumed that students will have had some exposure both to Asian culture and art history in the West. T Th 11:15 and an additional hour to be arranged. Mrs. King.

A comparative examination of European and Asian art forms with particular concern for the aesthetic determinants. Lectures will cover such subjects as the religious image as votive icon, implications of selectivity in rendering landscape, individualist position of the artist's role in society.

383. ART OF CHINA

Fall term. Credit four hours. M W 1:25 and an additional hour to be arranged. Mr. Young.

A systematic examination of three major epochs in Chinese art in an attempt to define significant characteristics of Chinese national and regional styles. The lectures will focus principally on paintings of the T'ang, Sung, and Ming Dynasties, but considerable attention will be devoted to the art of ceramics. Students will be expected to prepare a substantial term paper. Two lectures weekly plus a discussion section and occasional conferences.

[384. ART OF JAPAN]

Spring term. Credit four hours. M W F 11:15. Mr. Young. Not offered in 1969-70.

[386. THE ARTS OF INDIA AND SOUTHEAST ASIA]

Fall term. Credit four hours. M W F 10:10. Mr. O'Connor. Not offered in 1969-70.

Advanced Courses and Seminars

The following courses are intended primarily for majors, graduate students, or other advanced students who can meet the prerequisites. Courses at the 400 level are primarily for upperclassmen and majors; seminars at the 500 level are for graduate students and qualified senior majors. All seminars involve the writing and presentation of research papers. Enrollments are limited in this group of courses, and consent of the department or instructor is normally required. The 500-level courses with announced topics may be repeated.

401. MAJOR TUTORIAL

Either term. Credit two hours. Prerequisite, consent of a Department member.

Individual investigation and discussion on special topics not covered in the regular course offerings, by arrangement with various members of the Department. The course may be repeated.

402. MAJOR TUTORIAL

Either term. Credit four hours. Prerequisite, consent of a Department member.

Individual investigation and discussion on special topics not covered in the regular course offerings, by arrangement with various members of the Department. The course may be repeated.

[405. ORIGINAL WORKS OF ART]

Spring term. Credit four hours. Enrollment limited to twelve students. Prerequisite, at least four courses in the history of art and consent of the instructor or Department Chairman. F 1:25-3:20. Mr. Leavitt. Not offered in 1969-70.

[411. TECHNIQUES AND MATERIALS: PAINTING]

Fall term. Credit four hours. Limited to fifteen students. Prerequisite, at least four courses in the history of art and consent of the Chairman of the Department. T 1:25-3:20. Not offered in 1969-70.

[412. TECHNIQUES AND MATERIALS: GRAPHICS]

Spring term. Credit four hours. Limited to fifteen students. Prerequisite, at least four courses in the history of art and consent of the Chairman of the Department. T 1:25-3:20. Not offered in 1969-70.

421. METHODS OF HISTORICAL AND CRITICAL WRITING ON ART

Spring term. Credit four hours. Prerequisite, see below under topic for 1969-70. May be repeated for credit. Hours to be arranged.

The general problems involved with writing about the visual arts from various viewpoints: the historian, chronicler, aesthetician, theorist, reporter, or critic. Given each year by different members of the Department.

Topic for 1969-70: Problems of writing about current works. The central concern will be with the developing of viable modes of relating to and discussing highly innovative works. Prerequisite, History of Art 262, 376, or 263, and one other history of art course, plus consent of the instructor. Mrs. Benson.

431. GREEK SCULPTURE

Spring term. Credit four hours. Intended for art history majors or for other advanced students with special interest in classical civilization. T 1:25-3:20. Mr. Waage.

A study of the sculpture of the first culture whose artistic forms developed beyond those of the archaic stage; the causes of this advance and the factors which conditioned it. Both the Hellenic and the Hellenistic periods are covered.

Formerly History of Art 321.

[432. ARTS OF THE ROMAN EMPIRE]

Spring term. Credit four hours. Hours to be arranged. Mr. Waage. Not offered in 1969-70.

Formerly History of Art 322.

446. LITERARY SOURCES IN THE ITALIAN RENAISSANCE

Spring term. Credit four hours. Th 1:25-3:20. Mr. Selig.

An examination of a selected number of texts from the field of *Kunstliteratur* (Alberti, Leonardo, Vasari, among others), and consideration of their importance to the history of art and literary criticism with special attention to the critical terminology used. The texts will be read in English. Conducted as a seminar, with lectures, discussion, and reports.

493. HONORS WORK

Fall term. Credit four hours. Hours to be arranged.

Intended for seniors who have been admitted to the Honors program. Basic methods of art historical research will be discussed and individual readings assigned leading to the selection of an appropriate thesis topic.

494. HONORS WORK

Spring term. Credit four hours. Prerequisite History of Art 493.

The individual student, under faculty direction, will prepare a senior thesis.

531. PROBLEMS IN MEDIEVAL ART AND ARCHITECTURE

(Also Architecture 473, College of Architecture, Art and Planning)

Spring term. Credit four hours. Prerequisite, History of Art 341 or the consent of the instructor. T 1:25-3:20. Mr. Calkins.

Topic for 1969-70: A study of the relationships between late Gothic manuscript illumination and panel painting in Northern Europe in the fifteenth century. Conducted as a seminar, with lectures, discussions, research papers and reports.

548. STUDIES IN ITALIAN RENAISSANCE ART

Fall term. Credit four hours. Prerequisite, a previous course in Renaissance art, and consent of the instructor. W 1:25-3:20. Mr. Roe.

Topic for 1969-70: Michelangelo and Bernini as sculptors and architects.

[549. STUDIES IN ITALIAN RENAISSANCE ART]

Spring term. Credit four hours. T 1:25-3:20. Mr. Barolsky. Not offered in 1969-70.

552. STUDIES IN ENGLISH ART

Spring term. Credit four hours. Prerequisite, consent of the instructor. W 1:25-3:20. Mr. Roe.

Topic for 1969-70: The art and literary work of William Blake. Key works of Blake will be read as a guide to the interpretation of his visual symbolism. Blake's influence upon his immediate followers will also be considered.

563. PROBLEMS IN TWENTIETH-CENTURY ART

Fall term. Credit four hours. Prerequisite, History of Art 263 or 376 or equivalents and consent of the instructor. Th 1:25-3:20. Mrs. Benson.

Topic for 1969-70: Literal and nonliteral relationships in recent visual works.

564. PROBLEMS IN TWENTIETH-CENTURY ART

Spring term. Credit four hours. Prerequisite, History of Art 263 or 376 or equivalents and consent of the instructor. Th 1:25-3:20. Mr. Lipke.

Topic for 1969-70: To be announced.

565. PROBLEMS IN MODERN ARCHITECTURE

(Also Architecture 479, College of Architecture, Art, and Planning)

Spring term. Credit four hours. Prerequisite, consent of the instructor. W 1:25-3:20. Mr. Brown.

Topic for 1969-70: Historical problems in European architecture of the 1920's.

SEMINAR IN THE HISTORY OF AMERICAN ARCHITECTURE
(Architecture 478, College of Architecture, Art, and Planning)

Fall term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Jacobs.

[584. PROBLEMS IN CHINESE ART]

Spring term. Credit four hours. Prerequisite, consent of the instructor. W 1:25-3:20. Mr. Young. Not offered in 1969-70.

[586. STUDIES IN CHINESE PAINTING]

Spring term. Credit four hours. Prerequisite, History of Art 383 and consent of the instructor. W 1:25-3:20. Mr. Young. Not offered in 1969-70.

[588. SOUTHEAST ASIAN ART AND ARCHAEOLOGY]

Fall term. Credit four hours. Prerequisite, consent of the instructor. W 1:25-3:20. Mr. O'Connor. Not offered in 1969-70.

591-592. SUPERVISED READING

Throughout the year. Credit four hours, but may be taken more than once in the same term. For graduate students only.

Archaeology

Students who are interested in archaeology are directed especially to History of Art 313, 314, 322 and 588, all of which include archaeological material. The following specialized courses treat specific excavational material and procedures, and are therefore open only to a limited number of students who have some background in ancient history, ancient languages, anthropology, or art history.

[521. NUMISMATICS]

Fall term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Waage. Not offered in 1969-70.

523. CERAMICS

Fall term. Credit four hours. Prerequisite, consent of the instructor. T 1:25-3:20. Mr. Waage.

Pottery specimens from several Near Eastern sites will be studied to provide direct experience in one of the basic prerequisites of archaeological excavation—the identification and dating of pottery types. Two papers, delivered as reports in class, will concern ancient ceramic materials of particular types and periods, and possibly other related matters and material.

MATHEMATICS

Mr. W. H. J. Fuchs, Chairman; Messrs. M. S. Balch, J. M. Beck, I. Berstein, J. H. Bramble, L. D. Brown, S. U. Chase, M. M. Cohen, C. J. Earle, B. Eisenberg, W. G. Faris, R. H. Farrell, M. E. Fisher, S. Garfunkel, H. Garland, L. Gross, R. A. Hager, R. S. Hamilton, D. W.

Henderson, C. S. Herz, P. J. Hilton, K. Ito, A. V. Jategaonkar, P. J. Kahn, H. Kesten, J. C. Kiefer, A. W. Knapp, R. B. Lavine, S. A. Levin, S. Lichtenbaum, G. R. Livesay, M. D. Morley, A. Nerode, P. Olum, L. E. Payne, R. A. Platek, G. S. Rinehart, A. Rosenberg, O. S. Rothaus, S. H. Schanuel, A. H. Schatz, R. B. Schneider, L. S. Silver, F. L. Spitzer, M. E. Sweedler, R. J. Walker, H. C. Wang, W. C. Waterhouse, J. Wolfowitz, A. C. Zitronenbaum.

At all times a student at Cornell is urged to take the most advanced mathematics course for which he is prepared. Members of the Department are always available to discuss with students the appropriate courses for their levels of ability and interest, and students are urged to avail themselves of this help. However, much time may be saved by a careful reading of the following remarks.

BASIC SEQUENCES. There are two sequences in elementary calculus and in addition several special purpose sequences. The elementary calculus sequences have 111 in common. The upper sequence continues with 122-221-222 while the standard one continues with 112-213. Students who desire more mathematics should take the upper sequence, which is prerequisite for most of the advanced courses. The standard sequence is designed for students whose programs do not permit more than three semesters of mathematics and for those who find the upper sequence too demanding. A student whose performance in 112 has been exceptional can (with the consent of his instructor) be admitted into 221. A student in the 111-213 sequence who wants the linear algebra material of 221 may obtain it at an appropriate level by taking 331. The special-purpose sequences are, (a) 107-108, primarily for students in the biological and social sciences, (b) 191-192-293-294, primarily for engineers, and (c) 201-202, which is intended for social scientists and is available only to juniors and seniors.

ADVANCED PLACEMENT. Secondary school students are strongly urged to take one of the two Advanced Placement Examinations of the College Entrance Examination Board in their senior year. Students taking these examinations will automatically be offered advanced placement as follows.

Engineering students: A grade of 3 or higher on the AB examination, or of 2 or 3 on the BC examination will result in the offer of four hours advanced placement credit and placement into Mathematics 192. A grade of 4 or 5 on the BC examination will result in the offer of eight hours of advanced placement credit and placement into Mathematics 293.

All other students: A grade of 3 on the AB examination will result in the offer of three hours of advanced placement credit and placement into Mathematics 112. A grade of 4 or 5 on the AB examination or of 2 on the BC examination will result in the offer of three hours of advanced placement credit and placement into Mathematics 122. A grade of 3 on the BC examination will result in the offer of six hours advanced placement credit and placement into Mathematics 213. A grade of 4 or 5

on the BC examination will result in the offer of six hours advanced placement credit and placement into Mathematics 221.

There will be a placement examination in mathematics offered at Cornell just before the beginning of classes in the fall. Students placed in 112 who wish to enter 122, or those placed in 213 who wish to take 221, *must* take this examination. Students who did not take either one of the CEEB Advanced Placement Examinations and want advanced placement and advanced placement credit, or who did take one and received less advanced placement than they think they should have, *must* take this examination in the fall of their freshman year. A well prepared student who distinguishes himself on the Department's placement examination will be placed in 221 (or even higher) and may complete the upper sequence in the freshman year. In exceptional circumstances it is also possible to take 122 and 221 concurrently. Thus a student who has a very firm grounding in only the material of 111 may still be able to complete the upper sequence in one year. Such opportunities should be considered especially by students intending to major in mathematics or allied fields.

MAJOR OPTIONS. There are three options available for students intending to major in mathematics; the respective minimum requirements are listed below. In each case, a student will be accepted as a major by the Department only if he can reasonably be expected to have satisfied the prerequisite to his option by the end of the term in which he applies for admission to the major. This acceptance is contingent upon actual fulfillment of the prerequisites.

Option I. (This includes all prospective Honors candidates and all students who contemplate an eventual Ph.D. in pure or applied mathematics.) Prerequisite: Course 221-222. Requirements: (a) 411-412, (b) 431-432, (c) at least twelve additional hours of mathematics courses numbered 300 or above, other than 313, 315, 370; Computer Science 421, 422 may be included in these twelve hours.

The Department strongly recommends that all prospective Option I majors take Physics 207-208 in their freshman year. Those interested in the applications of mathematics should certainly do so and should also seriously consider the offerings in differential equations, probability and statistics, and numerical analysis.

Option II. (This includes those mainly interested in the application of mathematics who do not contemplate an eventual Ph.D. in mathematics or applied mathematics. It will not prepare a student for work at the Ph.D. level in the theoretical side of even such applied areas as statistics, numerical analysis, etc.) Prerequisites: (a) 221-222; (b) Physics 207-208. Requirements: (a) 421, 422; (b) 431, and either 332 or 432; (c) Computer Science 401; (d) an approved eight-hour sequence in statistics, numerical analysis (in the Department of Computer Science), or differential equations; (e) at least eight additional hours of courses numbered 300 or above in mathematics, computer science, or a physical science not including Mathematics 313, 315, 370.

Option III. (For prospective secondary school teachers and others who

wish to major in mathematics but do not intend to become professional mathematicians, e.g., premedical and prelaw students. This option does not prepare for graduate work in mathematics.) Prerequisites: (a) 222 or (a') 213 and 200, both at a high level of performance; (b) Physics 101-102, or 207-208. Mathematics requirements: (a) 311-312; (b) 331 if 221 has not been taken, 332; (c) 451-452; (d) Computer Science 401 or Industrial Engineering 9381; and either (e) four additional hours of mathematics courses numbered above 300 plus nine hours of Education courses (Mathematics 370 is recommended but not required) or (e') eight additional hours of mathematics courses numbered above 300. (Students planning to teach in secondary schools should make themselves familiar with state requirements. Students wishing to do student teaching must apply for this in Room 102, Stone Hall, by the end of their first term as juniors.)

In all 600-level courses, as well as in Course 515, the final grades will be only S or U.

THE HONORS PROGRAM. The requirements for Honors in mathematics are: (1) satisfaction of the requirements of Option I at a high level of performance; (2) satisfactory performance in the Honors Seminar 401; (3) satisfactory performance on an oral examination. (A knowledge of the material of 421, 422 will be required for this examination.)

Students wishing to take any of the courses numbered 300 or above are invited to confer, before registering, with the instructor concerned.

Subject matter is indicated by the second digit thus: 0, general; 1,2, analysis; 3,4, algebra; 5,6, geometry; 7, probability and statistics; 8, logic; 9, other.

DISTRIBUTION REQUIREMENT. The Distribution requirement in mathematics is satisfied with any six hours in mathematics.

General

Students wanting a general introductory mathematics course are advised to take 107-108.

200. BASIC CONCEPTS OF MATHEMATICS

Spring term. Credit three hours. Prerequisite, 213 or consent of the instructor, 112. T Th S 9:05.

Primarily for prospective teachers and other undergraduates with a cultural interest in mathematics. Set theory, logic, axiom systems, the real number field, other simple algebraic structures, cardinal numbers.

401. HONORS SEMINAR

Fall term. Credit four hours. Prerequisite, provisional acceptance as a candidate for Honors. Hours to be arranged.

Students will discuss selected topics under the guidance of one or more members of the staff. This seminar is required for Honors in mathematics.

[101-102. SELECTED TOPICS IN MATHEMATICS]

Throughout the year. Credit three hours a term. First term prerequisite to the second. Not offered in 1969-70.

Basic Sequences

107-108. FINITE MATHEMATICS AND CALCULUS WITH APPLICATIONS TO THE BIOLOGICAL AND SOCIAL SCIENCES

May be started either term. Credit three hours a term. Prerequisites, *three years of high school mathematics, including trigonometry*. 107, fall term: lectures, M W 11:15, 12:20 plus two hours to be arranged. 107, spring term: lectures, M W 12:20 plus two hours to be arranged. 108, fall term: lectures, M W 12:20 plus two hours to be arranged. 108, spring term: lectures, M W 11:15, 12:20 plus two hours to be arranged. Preliminary examinations will be held at 7:30 P.M. October 16, November 13, December 11, March 5, March 26, May 7.

This course is intended primarily for students in the more descriptive areas of biological and social sciences, who would otherwise be taking Mathematics 111. It can be expected that this course will be terminal for some of these students. Students who take Orientation 110 will not be admitted into Mathematics 111 and should take Mathematics 107-108. Mathematics 111 is recommended for students with higher SAT scores and who plan to study the more analytic aspects of biology; for example, those who wish to concentrate in biochemistry. However, Mathematics 107 will provide a foundation in finite mathematics, useful to many students of the biological and social sciences, that is not offered in Mathematics 111. Moreover, Mathematics 107-108 will provide a foundation for the further study of calculus equivalent to that provided by Mathematics 111. The student will probably find that the exposure to finite mathematics in Mathematics 107 facilitates the subsequent learning of calculus in Mathematics 108.

Mathematics 107-108 is not recommended for students in the physical sciences, engineering or mathematics.

A student may not receive credit for both Mathematics 108 and Mathematics 111 but may receive credit for both Mathematics 107 and Mathematics 111.

Mathematics 107: Logic and set theory, probability, vectors and matrices, linear programming, functions and graphs. Mathematics 108: Behavior of functions, introduction to integral and differential calculus, elementary differential equations.

111. CALCULUS

Either term. Credit three hours. Prerequisite, *three years of high school mathematics, including trigonometry*. Fall term: lectures, M W 11:15, 12:20 plus one hour to be arranged. Spring term: M W F 8; T Th S 8. Preliminary examinations will be held at 7:30 P.M. October 13, November 10, and December 8.

Plane analytic geometry, differentiation and integration of algebraic and trigonometric functions, applications.

112. CALCULUS

Either term. Credit three hours. Prerequisite, 111 or 108. Fall term. M W F 9:05, 10:10; T Th S 9:05. Spring term: lectures, M W 11:15 plus one hour to be arranged. Preliminary examinations will be held at 7:30 P.M. on March 2, March 23, and May 4.

If there is sufficient demand there will be a special section of 112 in the fall term for Biochemistry majors. Satisfactory completion of this section will prepare the student for Physical Chemistry.

Differentiation and integration of elementary transcendental functions, the technique of integration, conic sections, polar coordinates, infinite series.

213. CALCULUS

Either term. Credit three hours. Prerequisite, 112 or, in exceptional cases, 108. Fall term: lectures, T Th 10:10 plus one hour to be arranged. Spring term: M W F 8, 10:10. Preliminary examinations will be held at 7:30 P.M. on October 13, November 10, and December 8.

Solid analytic geometry and vectors, partial differentiation, multiple integrals, differential equations.

122. CALCULUS

Either term. Credit three hours. Prerequisite, recommendations of the lecturer in Course 111 or 108. (This will be based on exceptional performance.) For fall term, admission by consent of the Department. Fall term: M W F 11:15; T Th S 9:05. Spring term: M W F 10:10, 11:15; T Th S 9:05, 10:10.

Covers content of 112 in more detail and includes more theoretical material.

221. CALCULUS

Either term. Credit four hours. Prerequisite, grade of B or better in 122 or (with consent of the instructor) exceptional performance in 112. Fall term: M W F 8, 10:10; T Th S 8, 10:10. Spring term: M W F 11:15; T Th S 9:05.

Linear algebra and differential equations. Topics include vector algebra, linear transformations, matrices, linear differential equations, and systems of linear differential equations with constant coefficients.

222. CALCULUS

Either term. Credit four hours. Prerequisite, 221. Fall term: M W F 9:05. Spring term: M W F 8, 10:10; T Th S 10:10.

Vector differential calculus, calculus of functions of several variables, multiple integrals.

221H-222H. CALCULUS

Honors section of 221-222. Throughout the year. Credit two hours a term. Prerequisite, consent of the instructor. Open only to students simultaneously registered in 411-412. Hours to be arranged.

191. CALCULUS FOR ENGINEERS

Either term. Credit four hours. Prerequisite, *three years of high school mathematics, including trigonometry*. Fall term: lectures, M W F 9:05, 11:15, plus recitation periods to be arranged. Spring term: M W F S 9:05, 11:15. Preliminary examinations will be held at 7:30 P.M. on October 8, October 29, November 19, and December 10.

Plane analytic geometry, differential and integral calculus, applications.

193. CALCULUS FOR ENGINEERS

Fall term. Credit four hours. Prerequisite, *four years of high school mathematics, including trigonometry and calculus*. Lectures, M W F 9:05, 11:15, plus recitation periods to be arranged. Preliminary examinations will be held at 7:30 P.M. on October 8, October 29, November 19, and December 10.

Plane analytic geometry, differential and integral calculus, applications.

192. CALCULUS FOR ENGINEERS

Either term. Credit four hours. Prerequisite, 191 or 193. Fall term: M W F S 9:05, 11:15. Spring term: lectures, M W F 9:05, 11:15, plus recitation periods to be arranged. Preliminary examinations will be held at 7:30 P.M. on February 18, March 11, April 8, and May 6.

Transcendental functions, technique of integration and multiple integrals, vector calculus, analytic geometry in space, partial differentiation, applications.

194. CALCULUS FOR ENGINEERS

Spring term. Credit four hours. Prerequisite, recommendation of the lecturer in Course 191 or Course 193. Lectures, M W F 9:05, 11:15, plus recitation periods to be arranged. Preliminary examinations will be held at 7:30 P.M. on February 18, March 11, April 8, and May 6.

Covers contents of 192 in more detail and includes more theoretical material.

293-293H. ENGINEERING MATHEMATICS

Either term. Credit four hours. Prerequisite, 192 or 194. Fall term: lectures, M W F 8, 12:20, plus recitation periods to be arranged. Spring term: M W F S, 9:05, 11:15. Preliminary examinations will be held at 7:30 P.M. on October 14, November 11, and December 9. 293H is an Honors section in the fall term only.

Vectors and matrices, first-order differential equations, infinite series, complex numbers, applications. Problems for programming and running on the automatic computer will be assigned, and students are expected to have a knowledge of computer programming equivalent to that taught in Engineering 104.

294-294H. ENGINEERING MATHEMATICS

Either term. Credit three hours. Prerequisite, 293. Fall term: M W F 8, 12:20. Spring term: lectures, M W 8, 12:20, plus recitation periods to be arranged. Preliminary examinations will be held at 7:30 P.M. on March 3, March 24, and May 5. 294H is an Honors section in the spring term only.

Linear differential equations, quadratic forms and eigenvalues, differential vector calculus, applications.

201-202. MATHEMATICS FOR SOCIAL SCIENTISTS

Throughout the year. Credit four hours a term. Prerequisite, upperclass standing. First term prerequisite to second. M W F 11:15.

A treatment of calculus and other topics of interest to social scientists. This course will not prepare the student to continue mathematics beyond the 400 level.

Applied Mathematics and Differential Equations

313. TOPICS IN ALGEBRA AND ANALYSIS FOR ENGINEERS

Fall term. Credit four hours. Prerequisite, 213. M W F 9:05.

Some topics in modern algebra and advanced calculus useful in engineering. As many topics as time permits will be treated rigorously. The algebra includes geometry of vector spaces, simple properties of linear operators including eigenvalues and eigenvectors. The topics in advanced calculus discussed are calculus of several variables, Lagrange multipliers, and Laplace transforms.

315. HIGHER CALCULUS

Fall term. Credit three hours. Prerequisite, 213. T Th S 10:10.

Intended for students who have had only three semesters of calculus. It does not prepare for 415-416, and will not meet the needs of those graduate students whose work requires really serious application of mathematical methods.

Vector analysis. Ordinary and partial differential equations. Fourier series. Special functions. Laplace transforms. Emphasis is placed on a wide range of formal applications of the calculus rather than on the logical development.

322. CALCULUS OF VARIATIONS

Spring term. Credit four hours. Prerequisite, 222. T Th S 11:15.

Euler's equations. Classical examples. Isoperimetric problems. Canonical form of Euler's equations. Variational principles and conservation laws in physics. Hamilton-Jacobi theory.

421. APPLICABLE MATHEMATICS

Fall term. Credit four hours. Prerequisite, 222 or Honors section of 294 or consent of the instructor. (Students from regular sections of 294 will be admitted upon the 294 instructor's recommendation, provided their grades are very high and they make up the extra work.) M W F 12:20, Th 2:30.

Graduate students who need mathematics extensively in their work and who have had a solid advanced calculus course as undergraduates should take 415-416. If they have not had such an advanced calculus course they should take 421-422-423. If their preparation is still too weak for this, they should take all or part of 221-222, followed by 421-422-423.

Theorems of Stokes, Green, Gauss, etc. Sequences and infinite series. Fourier series and orthogonal functions. Introduction to complex variables.

422. APPLICABLE MATHEMATICS

Spring term. Credit four hours. Prerequisite, 421 or consent of the instructor. M W F 12:20, Th 2:30.

Continuation of complex variables. Conformal mappings. Harmonic functions. Some special functions. Differential equations. Laplace and Fourier transforms. Asymptotic expansions of functions.

423. APPLICABLE MATHEMATICS

Fall term. Credit four hours. Prerequisite, 422. M W F 12:20, Th 2:30.

Linear operators and integral equations. Calculus of variations. Application to eigenvalue problems. Green's function, and treatment of special problems of mathematical physics.

415-416. MATHEMATICAL METHODS IN PHYSICS

Throughout the year. Credit four hours a term.

Intended for graduate students in physics or related fields who have had a strong advanced calculus course and at least two years of general physics. The course goes very quickly, covering in two semesters slightly more than 421-422-423. Undergraduates will be admitted only with consent of the instructor. First term prerequisite to second. T W Th F 12:20.

Lectures and problem work designed to give a working knowledge of the principal mathematical methods used in advanced physics. Topics include a brief discussion of some basic notions: metric space, vector space, linearity, continuity, integration. Generalized functions (Schwartz distributions). Fourier series and Fourier integrals. Elementary complex variable. Saddle point method. Linear transformations in finite and in infinite-dimensional spaces. Matrices. Differential operators and integral operators, the equations and eigenvalue problems connected with them and the special functions arising from them. Elements of group theory. The rotation group and its representations.

491-492. MATHEMATICAL ECONOMICS

Throughout the year. Credit four hours a term. Prerequisite, 222. First term prerequisite to second. M W F 11:15.

Development and analysis of macroeconomic evolution equations for a Keynesian economy with fixed technology. Value theory. Some topics from

microeconomic theory: profit-maximizing theory of the firm, monopolistic competition, consumer behavior. Some topics from economic development theory.

517-518. ORDINARY DIFFERENTIAL EQUATIONS

Throughout the year. Credit four hours a term. Prerequisites, 411-412 and some acquaintance with complex variables, or consent of the instructor. First term prerequisite to the second. M W F 10:10.

For description see the *Announcement of the Graduate School: Physical Sciences*.

519-520. PARTIAL DIFFERENTIAL EQUATIONS

Throughout the year. Credit four hours a term. Prerequisite, some acquaintance with complex variables and advanced calculus or, with consent of the instructor, 423 or 416. First term prerequisite to the second. T Th S 10:10.

For description see the *Announcement of the Graduate School: Physical Sciences*.

521. ELEMENTARY FUNCTIONAL ANALYSIS

Fall term. Credit four hours. Prerequisite, 415-416 or 421-422-423, or consent of the instructor. T Th S 9:05.

Elementary set theory and topology, Banach and Hilbert spaces, measure and integration. Graduate students in mathematics should take 613 for Functional Analysis.

522. APPLIED FUNCTIONAL ANALYSIS

Spring term. Credit four hours. Prerequisite, 521. T Th S 9:05.

Spectral theorem for bounded operators, spectral theory for unbounded operators in Hilbert space, compact operators, distributions. Applications.

627-628. SEMINAR IN PARTIAL DIFFERENTIAL EQUATIONS

Throughout the year. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged.

[427-428. INTRODUCTION TO DIFFERENTIAL EQUATIONS]

Throughout the year. Credit four hours a term. Prerequisite, 222, or 294, or consent of the instructor. First term prerequisite to the second. Not offered in 1969-70.

[619-620. ADVANCED PARTIAL DIFFERENTIAL EQUATIONS]

Throughout the year. Credit four hours a term. Prerequisites, 512 and 613 or consent of the instructor. Not offered in 1969-70.

For courses in numerical analysis see Computer Science 421, 422.

Analysis

311-312. ELEMENTARY ANALYSIS

Throughout the year. Credit four hours a term. Prerequisites, 213, 200. T Th S 10:10.

A careful study of the topology of the real line. Functions. Theory of continuous functions of one real variable. Differentiation and integration of such functions. Series and sequences. Functions of several variables. Applications.

The material of this course is similar to that of 411-412, below, but is taught at a more elementary level and at a slower pace. A student may not receive credit for both 311-312 and 411-412.

411-412. INTRODUCTION TO ANALYSIS

Throughout the year. Credit four hours a term. Prerequisite, 222. T Th S 10:10.

(There will be a special Honors section of this course. The instructor should be consulted.)

An introduction to the theory of functions of real variables, stressing rigorous logical development of the subject rather than technique of applications. Topics include elementary topology, the real number system, continuous and differentiable functions, integration, convergence and approximation theorems, Fourier series, calculus in several variables and differential forms.

413. INTRODUCTION TO THE THEORY OF FUNCTIONS OF ONE COMPLEX VARIABLE

Spring term. Credit four hours. Prerequisite, 222 or 312. M W F 9:05. 411 is not a prerequisite, but some previous acquaintance with advanced calculus as presented in 411 is definitely helpful.

A rigorous introduction to complex variable theory. Intended mainly for undergraduates and for graduate students outside mathematics; graduate students in mathematics desiring a first course in complex variables should take 511-512. Complex numbers. Differential and integral calculus for functions of a complex variable including Cauchy's theorem and the calculus of residues. Elements of conformal mapping. Elements of several complex variables.

511-512. REAL AND COMPLEX ANALYSIS

Throughout the year. Credit four hours a term. Prerequisite, graduate standing or consent of the instructor; familiarity with the content of 412 is assumed. T Th S 10:10.

First term: Set-theoretic preliminaries, abstract integration, Borel measures, Lebesgue measure, L_p spaces, Hilbert spaces, Banach spaces, product spaces, differentiation. Second term: Fourier transforms. Complex variables, harmonic functions. Schwarz lemma, approximation by rational functions, conformal mappings, including Riemann mapping theorem, Weierstrass- and Mittag-Leffler theorems, Jensen's formula, analytic continuation, the modular function, Picard's theorem.

515. POTENTIAL THEORY

Spring term. Credit four hours. Prerequisite, 512. Hours to be arranged.

Newtonian as well as logarithmic potential, capacity, Green's functions and the Dirichlet problem in Euclidean space. Either applications to function theory, or integral representation theorems, or some probabilistic potential theory.

611-612. SEMINAR IN ANALYSIS

Throughout the year. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged.

613. FUNCTIONAL ANALYSIS

Spring term. Credit four hours. Prerequisites, 432 and 511. Hours to be arranged.

Topological vector spaces, Banach and Hilbert spaces, Banach algebras. Additional topics to be selected by instructor.

615. FOURIER ANALYSIS

Fall term. Credit four hours. Prerequisites, 500 and 511. Hours to be arranged.

Fourier series on compact groups (the Peter-Weyl theorem). Convolution operators. Extensions to amenable groups. The course will emphasize certain problems of classical harmonic analysis in a general group setting and representation theory will be of only secondary concern.

623. SEVERAL COMPLEX VARIABLES

Fall term. Credit four hours. Prerequisites, 500 and 512. Hours to be arranged.

An introduction to the theory of functions of several complex variables. Domains of holomorphy, removable singularities, analytic varieties. Stein manifolds.

[514. COMPLEX VARIABLE THEORY]

Spring term. Credit four hours. Prerequisites, 512 and 500. Not offered in 1969-70.

[523. ANALYSIS ON MANIFOLDS]

Spring term. Credit four hours. Prerequisites, 500 and 512. Not offered in 1969-70.

[528. VARIATIONAL METHODS]

Spring term. Credit four hours. Prerequisite, 413. Not offered in 1969-70.

[617. ANALYTIC NUMBER THEORY]

One term. Credit four hours. Prerequisite, 514. Not offered in 1969-70.

[621. MEROMORPHIC FUNCTIONS]

Fall term. Credit four hours. Prerequisite, consent of the instructor. Not offered in 1969-70.

[622. RIEMANN SURFACES]

Fall term. Credit four hours. Prerequisite, 512; 531 is desirable. Not offered in 1969-70.

Algebra

331. LINEAR ALGEBRA

Either term. Credit four hours. Prerequisites, 200 or consent of the instructor, and 213. *A student may not receive credit in both 221 and 331.* M W F 10:10.

Emphasis on applications rather than theoretical development. Vectors, matrices, and linear transformations, affine and euclidean spaces, transformation of matrices, eigenvalues.

332. ALGEBRA AND NUMBER THEORY

Spring term. Credit four hours. Prerequisite, 221 or 331. M W F 10:10.

Commutative rings with unity, fields, and finite groups. Motivations and examples are mostly derived from arithmetical problems on the integers or congruence classes of integers. Course 332 will not serve as a prerequisite for courses numbered 500 or higher.

431-432. INTRODUCTION TO ALGEBRA

Throughout the year. Credit four hours a term. Prerequisite, 221 or 331. First term prerequisite to second. M W F 10:10. (There will be a special Honors section of this course. The instructor should be consulted.)

A rigorous introduction to modern algebra. First term, linear algebra. Second term, introduction to algebraic systems such as groups, rings, modules and fields.

531-532. ALGEBRA

Throughout the year. Credit four hours a term. Prerequisite, graduate standing or consent of the instructor; familiarity with the content of 432 is assumed. First term prerequisite to the second. T Th 12:30-2.

First term: finite groups, field extensions, Galois theory, rings and algebras, tensor algebra. Second term: Wedderburn structure theorem, Brauer group, group cohomology, Ext, Dedekind domain, primary decomposition, Hilbert basis theorem, local rings. Additional topics selected by instructor.

549-550. LIE GROUPS AND DIFFERENTIAL GEOMETRY

Throughout the year. Credit four hours a term. Prerequisites, 500 and 531.

Differentiable manifolds. Basic properties of Lie groups and their relationship to Lie algebras. Compact Lie groups; maximal tori; the Weyl group. Theory of Lie algebras over the real and complex fields. The classical groups.

631-632. SEMINAR IN ALGEBRA

Throughout the year. Credit four hours a term. Prerequisite, consent of the instructor. Hours to be arranged.

633. GROUP THEORY

Spring term. Credit four hours. Prerequisite, 531. Hours to be arranged.

Representations and characters of finite groups; transfer and induced representations. Applications to structure of finite groups as time permits.

637. ALGEBRAIC NUMBER THEORY

Fall term. Credit four hours. Prerequisite, 532 or consent of the instructor. Hours to be arranged.

A summary of the algebraic foundations followed by a discussion of some classical problems: class numbers, primes in arithmetic progressions, binary quadratic forms and genera.

641. HOMOLOGICAL ALGEBRA

Spring term. Credit four hours. Prerequisite, 531. Hours to be arranged.

Adjoint functor theorems. Abelian and tripleable categories, topos. Simplicial objects and their homology, with applications to homology of groups, algebras, commutative rings, and to Amitsur cohomology.

[635. THEORY OF RINGS]

Spring term. Credit four hours. Prerequisites, 532 or 637. Not offered in 1969-70.

[639. HOPF ALGEBRAS]

Fall term. Credit four hours. Prerequisite, 532. Not offered in 1969-70.

[649. TOPOLOGICAL GROUPS]

Fall term. Credit four hours. Prerequisites, 500 and 531. Not offered in 1969-70.

Geometry and Topology

451-452. CLASSICAL GEOMETRIES

Throughout the year. Credit four hours a term. Prerequisite, 221 or 331 or 431, which may be taken concurrently. First term prerequisite to the second. T Th S 9:05.

Axiomatic methods in geometry. Foundations of Euclidean geometry. Non-Euclidean geometry, projective geometry, other geometric theories.

453-454. INTRODUCTION TO TOPOLOGY AND GEOMETRY

Throughout the year. Credit four hours a term. Prerequisites, 412 and 432, or consent of the instructor. M W F 12:20.

This is a new course (designed primarily for Option I Mathematics Majors) which will continue to be somewhat experimental in its second year 1969-70. It will cover topics in general and algebraic topology, differentiable manifolds, and perhaps some differential geometry.

500. GENERAL TOPOLOGY

Fall term. Credit four hours. Prerequisite, graduate standing or consent of the instructor. T Th S 11:15.

Topics from set theory, topological spaces, function spaces, manifolds, and topological groups. Fundamental group and covering spaces.

551. INTRODUCTORY ALGEBRAIC TOPOLOGY

Spring term. Credit four hours. Prerequisites, 432 and 500. M W F 10:10.

Homology and cohomology theories for complexes and spaces. Manifolds and geometric applications.

552. DIFFERENTIABLE MANIFOLDS

Spring term. Credit four hours. Prerequisites, 500, 531 or their equivalents. T Th S 11:15.

Manifolds and differentiable structures. Tangent, cotangent, and tensor bundles. Exterior calculus. Riemannian structures. Local and global theory of differential equations. Integration on manifolds.

651-652. SEMINAR IN TOPOLOGY

Throughout the year. Credit four hours a term. Prerequisite, consent of the instructor. Hours to be arranged.

653-654. ALGEBRAIC TOPOLOGY

Throughout the year. Credit four hours a term. Prerequisite, 551 or the equivalent. Hours to be arranged.

Duality theory in manifolds, applications, cohomology operations, spectral sequences, homotopy theory, general cohomology theories, categories and functors.

657-658. ADVANCED TOPOLOGY

Throughout the year. Credit four hours a term. Prerequisites, 551 or consent of the instructor. Hours to be arranged.

A selection of advanced topics from modern algebraic, differential, geometric topology and modern differential geometry.

667. ALGEBRAIC GEOMETRY

Fall term. Credit four hours. Prerequisites, 500 and 531. Hours to be arranged.

The theory of algebraic curves. The Riemann-Roch theorem. Projective embeddings. Singularities.

[352. ELEMENTARY TOPOLOGY]

Spring term. Credit four hours. Prerequisite, 221 or 331. Not offered in 1969-70.

[655-656. HOMOTOPY THEORY]

Throughout the year. Credit four hours a term. Prerequisite, 551. Not offered in 1969-70.

[659. SYMMETRIC SPACES]

Spring term. Credit four hours. Prerequisite, 549-550. Not offered in 1969-70.

[661-662. SEMINAR IN GEOMETRY]

Throughout the year. Credit four hours a term. Prerequisite, consent of the instructor. Not offered in 1969-70.

[663. MANIFOLDS]

Throughout the year. Credit four hours a term. Prerequisite, 551. Not offered in 1969-70.

Probability and Statistics

370. ELEMENTARY STATISTICS

Fall term. Credit four hours. Prerequisites, 112, 122 or 202, or 108 with consent of the instructor. M W F 12:20. Preliminary examinations will be held at 7:30 P.M. on October 15, November 12, and December 10.

Topics in probability which are essential to an understanding of statistics; introduction to the principles underlying modern statistical inference and the rationale underlying choice of statistical methods in various situations. This is a terminal course, intended for those who will take no further work in this area.

371. BASIC PROBABILITY

Fall term. Credit four hours. Prerequisite, 213 or 222. M W F 12:20. Preliminary examinations will be held at 7:30 P.M. on October 15, November 12, and December 10.

Topics covered include combinatorics, important probability laws, expectations, moments, moment generating functions, limit theorems. Emphasis is on diverse applications and on development of use in statistical applications. While this course can serve as a terminal course in basic probability, it is primarily intended for those who will continue with 472. (See also the descriptions of 370 and 571.)

472. STATISTICS

Spring term. Credit four hours. Prerequisite, 371 and knowledge of linear algebra such as taught in 221. M W F 12:20. Preliminary examinations will be held at 7:30 P.M. on March 4, March 25, and May 6.

Classical and recently developed statistical procedures are discussed in a framework which emphasizes the basic principles of statistical inference and the rationale underlying the choice of these procedures in various settings. These settings include problems of estimation, hypothesis testing, large sample theory. (See also the description of 370, 473, 574.)

473. STATISTICS

Fall term. Credit four hours. Prerequisite, 472 or 574 (572 in the 1968-69 *Announcement*). M W F 12:20. Preliminary examinations will be held at 7:30 P.M. on October 15, November 12, and December 10.

A continuation of Mathematics 472 in which emphasis will be placed on experimental designs, nonparametric statistics, multivariate analysis, sequential analysis and multiple decision problems.

Course numbers 571, 572 and 574 refer to new courses different from those with the same numbers in previous Announcements.

571-572. PROBABILITY THEORY

Throughout the year. Credit four hours a term. Prerequisite, 412. M W F 9:05.

Properties and examples of probability spaces. Sample space, random variables and distribution functions. Expectation and moments. Independence, Borel-Cantelli lemma, zero-one law. Convergence of random variables, probability measures and characteristic functions. Laws of large numbers. Selected limit theorems for sums of independent random variables. Markov chains, recurrent events. Ergodic and renewal theorems. Martingale theory. Brownian motion and processes with independent increments.

571-574. PROBABILITY AND STATISTICS

Throughout the year. Credit four hours a term. Prerequisite, 412, 571, fall term: M W F 9:05; 574, spring term: M W F 12:20.

First term: Same as first term of 571-572. Second term: Topics include an introduction to the theory of point estimation, consistency, efficiency, sufficiency, and the method of maximum likelihood; the classical tests of hypotheses and their power; the theory of confidence intervals; the basic concepts of statistical decision theory; the fundamentals of sequential analysis.

Intended to furnish a rigorous introduction to mathematical statistics, the course is prerequisite to all advanced courses in statistics.

671-672. SEMINAR IN PROBABILITY AND STATISTICS

Throughout the year. Credit four hours. Prerequisite, consent of the instructor. M 4-6.

675. STATISTICAL ESTIMATION

Fall term. Credit four hours. Prerequisite, 574 (572 in the 1968-69 edition of this *Announcement*). Hours to be arranged.

Randomization, sufficiency, completeness, minimum variance estimators. Derivation of sequential minimax estimators by the methods of differential inequalities, Bayes solutions, and invariance. The Neyman-Pearson theory of testing hypotheses and interval estimation.

676. DECISION FUNCTIONS

Spring term. Credit four hours. Prerequisite, 675. Hours to be arranged.

Wald's theory of decision functions. Multidecision problems. Existence theorems, complete class theorems, and other general decision theoretic results. Optimum character of the sequential probability ratio test. Recent developments.

575. INFORMATION THEORY

Spring term. Credit four hours. Prerequisite, 411, or, with consent of the instructor, 416 or 421. Familiarity with at least part of the contents of 571

would be helpful. No prior knowledge of information theory is required for this course, but a modest amount of mathematical maturity is desirable. W F 2:30-4. Mr. Wolfowitz.

Coding theorems and their converses for the principal noisy channels. Sequential decoding. Two-way codes. Coding with a fidelity criterion. Study of the probability of error. Very recent results on channels with arbitrarily varying channel probability functions and on compound channels.

[673. ANALYSIS OF VARIANCE]

Fall term. Credit four hours. Prerequisites, 572 and 432. Not offered in 1969-70.

[674. DESIGN OF EXPERIMENTS]

Spring term. Credit four hours. Prerequisite, 673. Not offered in 1969-70.

[677-678. STOCHASTIC PROCESSES]

Throughout the year. Credit four hours a term. Prerequisites, 511 or 522, 571 or consent of the instructor. First term prerequisite to the second. Not offered in 1969-70.

[679. SEMINAR IN MATHEMATICAL ECONOMICS]

(Also Economics 685)

Spring term. Credit four hours. Prerequisite, consent of the instructor. Not offered in 1969-70.

Mathematical Logic

381. ELEMENTARY MATHEMATICAL LOGIC

Spring term. Credit four hours. Prerequisite, 122 or 200. M W F 11:15.

Propositional calculus via truth tables and as a formal axiomatic theory. Boolean algebras. Introduction to the predicate calculus.

581. LOGIC

Fall term. Credit four hours. Prerequisite, 432 or consent of the instructor. M W F 11:15.

Basic topics in mathematical logic including: Propositional and predicate calculus. Formal number theory and recursive functions. Completeness and incompleteness theorems.

681-682. SEMINAR IN LOGIC

Throughout the year. Credit four hours a term. Prerequisite, consent of the instructor. Hours to be arranged.

684. RECURSION THEORY

Spring term. Credit four hours. Prerequisite, 581 or consent of the instructor. M W F 11:15.

Theory of effectively computable functions. Classification of recursively enumerable sets. Degrees of recursive unsolvability. Applications to logic. Hierarchies. Recursive functions of ordinals and higher type objects. Generalized recursion theory.

687. SET THEORY

Fall term. Credit four hours. Prerequisite, 581 or consent of the instructor. Hours to be arranged.

Models of set theory. Theorems of Gödel and Cohen, recent independence results.

[683. MODEL THEORY]

Fall term. Credit four hours. Prerequisite, 581 or consent of the instructor. Not offered in 1969-70.

[685. METAMATHEMATICS]

Spring term. Credit four hours. Prerequisite, 581 or consent of the instructor. Not offered in 1969-70.

690. SUPERVISED READING AND RESEARCH

Variable credit.

MEDIEVAL STUDIES

Students who plan to do graduate work in medieval studies at Cornell or elsewhere have an opportunity to take many relevant courses as undergraduates. Instruction is available in the following areas: medieval Hebrew, medieval Arabic, medieval Latin, Old English, Middle English, Old Provençal, medieval French, medieval Spanish, medieval Italian, Old Saxon, Old High German, Middle High German, Gothic, Old Norse (Old Icelandic), Old Russian, Old Bulgarian, Old Church Slavonic, medieval art and architecture, medieval history, Latin paleography, medieval philosophy, musicology, comparative Slavic linguistics, and comparative Romance linguistics.

MODERN FOREIGN LANGUAGES AND LITERATURES

Courses in modern foreign languages and literatures are offered as follows:

DEPARTMENT OF GERMAN LITERATURE

Mr. Herbert Deinert, Chairman.

Courses in German literature.

DIVISION OF MODERN LANGUAGES

Mr. J. M. Cowan, Director.

All elementary and intermediate language courses; conversation and composition courses; courses in linguistics. For fulfillment of the Language Requirement for graduation see p. 18 and for attainment of

Qualification see p. 12. S/U options as provided for on p. 22 of this *Announcement* may be had for all courses listed under "Language and Linguistics" except for German 101-102 and Burmese, Thai, and Vietnamese.

An option is provided for elementary courses in some languages as follows: The Basic Course sequence, 101-102, gives a thorough grounding in the language—listening, speaking, reading, and writing. It is conducted in small groups with native speakers as instructors. The Elementary Reading Course sequence 131-132, 133-134 concentrates on the comprehension of written texts.

DEPARTMENT OF ROMANCE STUDIES

Mrs. Jean Parrish, Chairman.

Courses in French literature, Italian literature, and Spanish literature. See separate language headings for course listings and information about major programs.

DEPARTMENT OF RUSSIAN LITERATURE

Mr. G. Gibian, Chairman.

Courses in Russian literature.

Burmese

Mr. R. B. Jones, Jr., and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. M-F 10:10, T Th 11:15.

201-202. BURMESE READING

Throughout the year. Credit three hours a term. Prerequisite for 201, Qualification in Burmese; for 202, Burmese 201 or consent of the instructor. Hours to be arranged. Mr. Jones.

203-204. COMPOSITION AND CONVERSATION

Throughout the year. Credit three hours a term. Prerequisite for 203, Qualification in Burmese; for 204, Burmese 203 or consent of the instructor. Hours to be arranged. Mr. Jones.

301-302. ADVANCED BURMESE READING

Throughout the year. Credit four hours a term. Prerequisite, Burmese 201-202 or the equivalent. Hours to be arranged. Mr. Jones.

Selected readings in Burmese writings in various fields.

Cebuano (Bisayan)

Mr. J. U. Wolff and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. Offered according to demand. Hours to be arranged.

Chinese

Messrs. N. C. Bodman, F. C. Chin, J. McCoy, Mrs. Pei Shin Ni, Mr. H. Shadick, Mrs. Pilwun Wang, and staff.

For a major involving Chinese studies see Asian Studies.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. M-F 8, M W F 9:05.

131H-132H. ELEMENTARY HOKKIEN CHINESE

Throughout the year. Credit three hours a term. Prerequisite, consent of the instructor. M-F 11:15. Mr. Bodman.

[131C-132C. ELEMENTARY CANTONESE]

Throughout the year. Credit three hours a term. Prerequisite, consent of the instructor. M-F 11:15. Mr. McCoy. Not offered in 1969-70.

[133C-134C. INTERMEDIATE CANTONESE]

Throughout the year. Credit three hours a term. Prerequisite, Chinese 132C or equivalent. Hours to be arranged. Mr. McCoy. Not offered in 1969-70.

201-202. INTERMEDIATE CHINESE I

Throughout the year. Credit four hours a term. Prerequisite, Qualification in Chinese. M-F 9:05.

213. INTRODUCTION TO CLASSICAL CHINESE

Fall term. Credit three hours. Prerequisite, Qualification in Chinese. M W F 11:15. Mr. Shadick.

Systematic analysis of basic patterns in classical Chinese; study of texts; exercises in composition. An introduction to the literary style, primarily for students intending to work in classical literature, history, or art history.

301-302. INTERMEDIATE CHINESE II

Throughout the year. Credit four hours a term. Prerequisite, Chinese 202 or equivalent. M-F 10:10.

Readings and drill in modern expository Chinese, three hours; introduction to classical Chinese, two hours. This latter is intended to prepare students of modern Chinese to understand classical forms and quotations occurring in vernacular texts and to use dictionaries and reference works.

312. INTERMEDIATE CLASSICAL CHINESE

Spring term. Credit three hours. Prerequisite, Chinese 213 or 301. M W F 11:15. Mr. Shadick.

Study of texts in a variety of styles, ancient and modern.

313. CHINESE HISTORICAL AND PHILOSOPHICAL TEXTS

Fall term. Credit four hours. Prerequisite, Chinese 302 or 312, or consent of the instructor. T Th 11:15 and one hour to be arranged. Mr. Shadick.

Selections from the standard histories, the classical philosophers, and early modern reformers.

402. HISTORY OF THE CHINESE LANGUAGE

Either term. Credit four hours. Prerequisite, consent of the instructor. W 2:30-4:25. Mr. Bodman.

403. LINGUISTIC STRUCTURE OF CHINESE

Either term. Credit four hours. Prerequisite, consent of the instructor. T 2:30-4:25. Mr. Bodman.

411-412. ADVANCED READINGS IN MODERN CHINESE

Throughout the year. Credit four hours a term. Prerequisite, Chinese 302. M W F 1:25.

414. CLASSICAL CHINESE PROSE

Spring term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged.

416. CLASSICAL CHINESE POETRY AND DRAMA

Fall term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged.

420. READINGS IN THE TRADITIONAL CHINESE NOVEL

Either spring or fall term, according to demand. Credit two to four hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. McCoy.

421-422. DIRECTED READING

Throughout the year. Credit two or four hours a term. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Chow, Mr. Shadick.

521-522. ADVANCED READINGS IN CLASSICAL CHINESE

Throughout the year. Credit two or four hours a term. Prerequisite, consent of the instructor. Hours to be arranged.

571-572. SEMINAR IN CHINESE LITERATURE

Throughout the year. Credit and hours to be arranged.

SINO-TIBETAN LINGUISTICS

(See Linguistics 581-582) Mr. Bodman.

Dutch

Mr. J. M. Echols, Mr. F. van Coetsem and staff.

131-132. ELEMENTARY READING COURSE

Throughout the year. Credit three hours a term. Prerequisite, consent of the instructor. Hours to be arranged.

English as a Second Language

The following courses are offered by the Division of Modern Languages. Foreign students should consult a member of the Division at Morrill Hall 206.

102. ENGLISH AS A SECOND LANGUAGE

Fall term. Credit six hours. Prerequisite, placement by the instructor. Hours to be arranged.

211-212. ENGLISH AS A SECOND LANGUAGE

Throughout the year. Credit three hours a term. Prerequisite, placement by the instructor. M W F 11:15.

French

Messrs. L. J. Benoit, J. Béreaud, M. B. Civera, Miss Alice Colby, Messrs. H. Dieckmann, H.-J. Frey, Mrs. Janet Gordon, Messrs. D. I. Grossvogel, R. A. Hall, Jr., M. Lazar, Mrs. S. Alexandra Littauer, Mrs. Dorothy McCall, Messrs. E. P. Morris, J. S. Noblitt, Mrs. Jean Parrish, Messrs. B. L. Rideout, A. Seznec, and staff.

FRENCH MAJOR. Students who elect to major in French should ordinarily have completed French 201-202, and French 203-204 or its equivalent. A student majoring in French is expected to become conversant with a fair portion of the masterworks of French literature, to acquaint himself with the outlines of French literary history, and to develop some skill in literary analysis. To this end he will be expected to complete successfully twenty-eight hours of French literature courses at the 300 level or higher, with papers to be written in French. At least one 400 course in French literature must be included. One term of French 401, 402, or 403, may be substituted for four hours of the twenty-eight required in French literature (but not for the required 400 course in literature). One four-hour course offered by the Department of Comparative Literature may be counted toward the twenty-eight required hours if prior approval has been obtained from the major adviser.

The major student will also be expected to acquire competence in the handling of French. This competence will be demonstrated by the successful completion of French 304 or by the passing of an oral and written examination to be taken no later than the end of the first semester of the senior year. The level of the exam will be that ordinarily reached at the end of four semesters of language study beyond Qualification. (For definition of Qualification see page 12 of this Announcement.) The particular literature courses taken by any student will, of course, be partially determined by his level of preparation at entrance, personal talent, particular opportunities such as Junior Year Abroad, and the like. The placement in literature courses of incoming majors will be decided, in the case of students who have done no previous language work at Cornell, by an oral and written examination which will be administered in the second term of the sophomore year. For details, please consult the major adviser, Mr. Béreaud.

THE HONORS PROGRAM. The Honors program in French is open to superior students to be selected on the basis of grades, a letter of application, recommendation, and interview. Those students will meet weekly, during junior and senior years, in tutorial conferences with a faculty member. Junior tutorial will be devoted to intensive study of selected problems or authors and to the choice of a topic for the Honors essay; senior tutorial, to the preparation and writing of that essay.

Honors students may be released from one or two courses in either junior or senior year to write the Honors essay. They will take a general oral examination at the end of the senior year. For details, please consult Mr. Morris.

DISTRIBUTION REQUIREMENT. The Distribution requirement in the Humanities is satisfied in French by French 201-202 if this course is not used in fulfillment of the language requirement.

Of the courses listed below, those dealing with literature are, together with French 303-304 and 429, staffed and administered by the Department of Romance Studies, and inquiries in regard to them ought to be addressed to that Department (278 Goldwin Smith).

The courses dealing with language and linguistics are offered by the Division of Modern Languages, and administered by that Division (106 Morrill Hall).

LANGUAGE AND LINGUISTICS

101. BASIC COURSE

Fall term. Credit six hours. Students who have previously studied French should consult p. 12 before registering for this course. Drill, M-F 8, 9:05, 10:10 or 1:25; lecture, T Th 9:05 or 12:20.

102. BASIC COURSE

Either term. Credit six hours. Prerequisite, French 101 or its equivalent. Students who have previously studied French should consult p. 12 before registering for this course. Fall term: drill, M-F 8, 12:20, or 1:25; lecture, M W 11:15. Spring term: drill, M-F 8, 9:05, 10:10, or 1:25; lecture, T Th 9:05 or 12:20.

131-132. ELEMENTARY READING COURSE I

Throughout the year. Credit three hours a term. M W F 9:05, 12:20, 1:25, 2:30, or 3:35; lecture, M 12:20, T 12:20, or F 10:10.

133-134. ELEMENTARY READING COURSE II

Throughout the year. Credit three hours a term. Prerequisite, French 132 or the equivalent. M W F 2:30 or T Th S 9:05; lecture, F 1:25.

203. INTERMEDIATE COURSE (CONVERSATION)

Either term. Credit three hours. Prerequisite, Qualification in French (for definition of Qualification, see p. 12). Fall term: M W F 8, 11:15, 1:25, or T Th S 9:05 or 10:10; lecture, M W 10:10 or 12:20, or T Th 8 or 2:30. Spring term: M W F 10:10 or T Th S 11:15; lecture, T Th 1:25.

Guided conversation, grammar drill, and oral and written composition. Emphasis is placed upon increasing the student's oral command of French.

203R. INTERMEDIATE COURSE (READING)

Either term. Credit three hours. Prerequisite, Qualification in French (for definition of Qualification, see p. 12). M W F 11:15, 12:20, or 2:30, or T Th S 10:10 or 11:15; lecture, M W 8 or T Th 12:20, 1:25, or 2:30. Spring: M W F 12:20 or 2:30, or T Th S 11:15; lecture, T Th 1:25.

Extended readings in selected modern humanistic writings.

204. INTERMEDIATE COMPOSITION AND CONVERSATION

Either term. Credit three hours. Prerequisite, French 203. Fall term: M W F 10:10 or T Th S 11:15; lecture, T Th 1:25. Spring term: M W F 8, 11:15, or 1:25, or T Th S 9:05 or 10:10; lecture, M W 10:10 or 12:20, or T Th 8 or 2:30.

Continuation of the work of French 203, with special attention to accurate and idiomatic expression in French. Oral and written drill.

303-304. ADVANCED COMPOSITION AND CONVERSATION

Throughout the year. Credit four hours a term. Prerequisite, French 204 or placement by special examination. M W F 9:05; one additional section, hours to be arranged. Mr. Béreaud and staff.

Reading and analysis of selected contemporary texts in order to increase students' vocabulary and command of idiomatic French. Detailed study of present-day syntax. Class discussion conducted in French. Weekly translations or essays in French. One hour of conversation each week in groups of two or three will give every student the opportunity of dealing with the specific problems he may encounter. The second semester places more emphasis on literary texts and their stylistic resources.

401-402. HISTORY OF THE FRENCH LANGUAGE

Throughout the year. Credit four hours a term. Prerequisites, Qualification in French and Linguistics 201. M W F 11:15. Mr. Benoit.

Fall term: detailed study of the structural development of French from the origins to the Old French period. Spring term: selected readings in Old French texts, examination of structural changes from the Old French period to the present.

403. LINGUISTIC STRUCTURE OF FRENCH

Fall term. Credit four hours. Prerequisites, Qualification in French and Linguistics 201. M W F 3:35. Messrs. Civera and Noblitt.

A descriptive analysis of present-day French, with emphasis on its phonetics, phonemics, morphology, and syntax. Required of students seeking certification by New York State.

THE COMPARATIVE STUDY OF THE ROMANCE LANGUAGES

(See Linguistics 441-442, 443-444, 445, 446, 449)

404. FRENCH FOR TEACHERS

Spring term. Credit four hours. Prerequisite, Qualification in French. Hours to be arranged. Mr. Benoit.

Survey of the current teaching methods, preparation of teaching materials, selection and use of textbooks and realia, further study of phonetics, syntax, and culture as needed. Required of students seeking certification by New York State.

429. COMPOSITION AND STYLE

Fall term. Credit four hours. Primarily for graduate students. Limited to ten students. Some qualified undergraduate majors will be admitted, as space permits. Prerequisite, (undergraduates) French 304; (graduates) placement at the departmental French language examination. M W F 11:15. Mr. Béreaud.

French 429 will normally be taken by all entering graduate students in French, with the exception of those exempted on the basis of the departmental examination, and those who, not being prepared to undertake work at the level of French 429, will be asked first to take French 303 or 304. French 429

presupposes competence in the handling of French vocabulary, syntax, and idiom. The purpose is to teach the writing of French as a means of effective expression on literary and historical subjects. Review of advanced grammar; translations from and into literary French; lexical, stylistic, and methodological study of selected French critical works; literary *explication de textes*; study of French versification; analysis of literary topics, and composition of outlines. Short daily or weekly papers. Conducted in French.

540. INTRODUCTION TO FRENCH PHILOLOGY

Spring term. Credit four hours. Required of all graduate students in French literature. Th 4:30-6:25. Mr. Hall.

A study of the phonological, morphological, syntactical, and etymological developments which most frequently create problems for the student of literature.

[554. GALLO-ROMANCE DIALECTOLOGY]

Spring term in alternate years. Credit four hours. Prerequisite, Linguistics 441-442, 443-444, or consent of the instructor. T Th 2:30. Mr. Benoit. Not offered in 1969-70.

555. HISTORICAL PHONOLOGY OF FRENCH

Fall term. Credit four hours. Prerequisite, Linguistics 201 or consent of the instructor. T Th 2:30. Mr. Civera.

The detailed study of sound changes from Latin to French, with attention to intermediate stages.

558. LINGUISTIC STRUCTURES OF OLD AND MIDDLE FRENCH

Spring term. Credit four hours. Prerequisite, French 403 or consent of the instructor. T Th 2:30. Mr. Noblitt.

An attempt at synchronic linguistic analysis of the French of approximately A.D. 1100 and 1600.

600. SEMINAR IN FRENCH LINGUISTICS

Offered in accordance with student needs. Credit four hours a term. Hours to be arranged. Mr. Hall.

LITERATURE

201-202. INTRODUCTION TO FRENCH LITERATURE

Primarily intended for freshmen. Course 201 prerequisite to 202. Both courses given each term. Credit three hours a term. Prerequisite, 630 achievement score in French. The course will presuppose the ability to read literary French with some facility. In the fall term, French 201 will be offered M W F 9:05, 10:10, 11:15, 12:20 or 2:30; or T Th S 9:05 or 11:15. French 202 will be offered M W F 12:20; T Th S 10:10 or 12:20. In the spring term, French 201 will be offered M W F 12:20; or T Th S 9:05 or 12:20. French 202 will be offered M W F 9:05, 10:10, 11:15, 12:20, or 2:30; or T Th S 9:05, 10:10, or 11:15. Mrs. Parrish, Mrs. McCall, Messrs. Béreaud, Seznec, Grossvogel and staff.

Serves as an intermediate reading course and as an introduction to literature. Complete works are read representing significant writings from the Middle Ages to the present.

French 201: Ronsard, Victor Hugo, Baudelaire, Mallarmé, Corneille, Racine, Anouilh.

French 202: Chrétien de Troyes, Montaigne, Mme. de LaFayette, Diderot, Proust, Sartre.

The object is to acquire reading skill while developing a critical appreciation of a foreign literature. English will be used rarely, and only at the beginning; as the year goes on, classes will be conducted exclusively in French.

201E-202E (Experimental section).

Enrollment limited. Students electing this experimental version of French 201-202 must take both semesters of it. T Th S 10:10. Mr. Morris.

Traditionally, French 201-202 has sought to introduce students to some acknowledged masterpieces of French literature, to accustom them to close and accurate reading of literary French, and to acquaint them with certain regularities inherent to short lyric poems, prose narrative, comedy and tragedy. In this course, the attempt will be made to achieve those same ends and at the same time to give the student some feeling for the ways, problems (social and spiritual) and accomplishments of selected moments in the history and literature of France. The course will not proceed by chronological "survey," but by historical "sections," or samplings. The relation of literary consciousness to historical consciousness will be explored: how does each age see itself, and write itself down? how does it portray other times?

The texts studied in 1969-70 will be chosen from the following:

(a) 1857 (after the failure of the revolution of 1848): Baudelaire, *les Fleurs du mal*; Flaubert, *Mme. Bovary*;

(b) The times of Louis XIV: Racine, *Andromaque*; La Fontaine, *Fables*; Mme. de LaFayette, *La Princesse de Clèves*; Molière, *Le Tartuffe*; Saint-Simon, *Mémoires*.

(c) 1909-1913 (France on the eve of the first world war): Gide, *la Porte étroite*; Claudel, *l'Annonce faite à Marie*; Apollinaire, *Alcools*; Proust, *Du côté de chez Swann*;

(d) From Romanesque to Gothic: *La Chanson de Roland*; Chrétien de Troyes, *Yvain*; Rutebeuf, *Le Miracle de Théophile*; a farce; lyric poems; chronicles of Villehardouin.

205. FRESHMAN SEMINAR: MODERN FRENCH DRAMA

Throughout the year. Credit three hours. M W F 1:25. Mrs. McCall.

For description see Freshman Humanities Program, p. 35.

207. PHILOSOPHY IN LITERATURE

Fall term. Credit three hours. T Th S 10:10. Mr. Lewis.

For description see Freshman Humanities Program, p. 36.

208. LITERATURE AND MARXISM IN TWENTIETH-CENTURY FRANCE

Spring term. Credit three hours. T Th S 10:10. Mr. Lewis.

For description see Freshman Humanities Program, p. 36.

355. MONTAIGNE

Fall term. Credit four hours. T 2:30-4:25, plus an hour of *travaux pratiques* to be arranged.

Main emphasis will be placed on Montaigne's history as a reader and writer, and on the attendant growth and inflections of his self-awareness; hence, also, on the invention and refinement of the essay as a literary form. Other topics touched on will include Montaigne in his times (public life, travels, religion, the wars) and the influence of Montaigne on such later writers as Pascal and

Gide. Extensive readings in Montaigne: written and oral analysis of individual essays. Lectures in French.

361. MOLIÈRE

Fall term. Credit four hours. Prerequisite, French 201-202. M W F 10:10. Mr. Seznec.

370. EIGHTEENTH-CENTURY SURVEY

Spring term. Credit four hours. Hours to be arranged. Mrs. Parrish.

Fictional works by the following major figures: Montesquieu, Voltaire, Diderot, Rousseau.

386. MASTERPIECES OF THE NINETEENTH-CENTURY NOVEL

Spring term. Credit four hours. Prerequisite, French 201-202 or consent of the instructor. T Th 1:25-3. Mr. Lewis.

Texts: Constant, *Adolphe*. Stendhal, *Le Rouge et le noir*. Balzac, *La peau de chagrin*. Flaubert, *L'Education sentimentale*. Zola, *Germinal*. Huysmans, *A rebours*. Lectures in French, classroom discussion, written reports.

390. MODERNISM

Spring term. Credit four hours. Prerequisite, French 201, 202, or 201 plus one French literature course. M W F 9:05. Mr. Grossvogel.

What's modern this year? The course will question the loss of a sense of history in certain avant-gardes, examining under a number of headings the recurrence of critical concerns, such as Ancients vs. Moderns: the problems of renewal, ritual form, memory content, symbolism, etc.; the Esthetic Quandary: the nature of Nature, Beauty, the object in art, etc.; the Vexation of Form: literary strategy, the artist within (and without) his work; the problems of psychology, biography, tone, etc.; the Phenomenological Heresy: modes of seeing, the artifact as immanence or object, the critical response, social consciousness, etc.

Readings: such authors as Baudelaire, Mallarmé, Valéry, Breton, Frye, Lukacs, Sartre, Robbe-Grillet, etc. Lectures and class discussions.

397. FRENCH NOVELS OF THE 1920'S AND 1930'S

Fall term. Credit four hours. Prerequisite, French 201-202 or consent of the instructor. M W F 11:15. Mrs. McCall.

Readings will include Gide, *Les Faux-Monnayeurs*; Mauriac, *Thérèse Desqueyroux*; Bernanos, *Journal d'un curé de campagne*; Céline, *Voyage au bout de la nuit*. Lectures in French, classroom discussion, written reports.

430. STYLISTICS

Spring term. Credit four hours. T Th 2:30-4. Mr. Morris.

The emergence of a modern "science of style," and some applications. Readings in such theorists and analysts as Lanson, Curtius, Spitzer, and the recent, linguistically-inclined critics. The development of stylistics will be treated historically; main theories of style will be tested against examples chosen from French literature. Frequent short oral and written reports. Conducted in French.

449. MEDIEVAL SEMINAR

Fall term. Credit four hours. Prerequisite, two terms of 300 level French literature courses or consent of the instructor. T Th 2:30-4:30. Mr. Lazar.

The devil and hell in medieval French literature.

461. PENSEURS AND MORALISTES, 1637-1697

Fall term. Credit four hours. Prerequisite, French 201-202 or consent of the instructor. T Th 1:25-3. Mr. Lewis.

Introduction to and/or *selective* readings in Descartes, Malebranche, Perrault, Cyrano, Boileau, Fénelon, La Bruyère, La Fontaine, and others, with reference to major currents and movements in seventeenth-century thought. Analytic reading and careful study of interpretive problems encountered in Pascal's nonscientific works and La Rochefoucauld's *Maximes* and *Réflexions diverses*, with reference to the problematics of a "crise de conscience" in the 1660's. Class discussion and papers in French.

466. LA FONTAINE

Spring term. Credit four hours. Prerequisite, French 201-202 and consent of the instructor. M 2:30-4:30. Mr. Seznec.

The emphasis will be on La Fontaine the poet. The major text read will be the *Fables*.

549. MEDIEVAL SEMINAR: TEXTUAL CRITICISM

Fall term. Credit four hours. T Th 10:10-12:05. Sept. 15-Oct. 30. Mr. Lazar.

The participants in this seminar will prepare and publish an edition of a medieval French text.

579. EIGHTEENTH-CENTURY SEMINAR: MARIVAUX

Fall term. Credit four hours. Hours to be arranged. Mrs. Parrish.

Marivaux's works, including both representative novels and plays will be read with a view to assessing as accurately as possible this author's contribution to two of the most important eighteenth-century genres.

597. GRADUATE SEMINAR IN TWENTIETH-CENTURY LITERATURE

Fall term. Credit four hours. M 2-4. Mr. Grossvogel.

Proust: A study of the major themes, techniques, and implications of *A la recherche du temps perdu*, as well as a review of the critical corpus concerned with that work.

German

Miss Eva Augsberger, Messrs. D. Bansberg, V. T. Bjarnar, E. A. Blackall, D. Connor, J. M. Cowan, J. B. Dallett, H. Deinert, R. L. Jones, H. L. Kufner, P. Lowe, Jr., F. van Coetsem, and staff.

GERMAN MAJOR. The student majoring in German is encouraged to design his program in a manner which will allow for considerable diversity in his course of study. It should enable him to become acquainted with an adequate selection of major works, authors and movements of German literature and to develop his skill in literary analysis. A student majoring in German will normally proceed through German 201-202 and 203-204. However, if his previous training qualifies him for immediate enrollment in 300 and 400 level courses, every effort will be made to permit him to do so. For details, please consult the major adviser, Mr. Connor. A student majoring in German is expected to complete successfully a minimum of six 300 and 400 level courses in addition to German 303-304. These courses should be a representative

selection of subjects in German literature and/or Germanic linguistics. The attention of students majoring in German is called to the courses offered by the Department of Comparative Literature, many of which complement the course offerings in German.

A student majoring in German is also expected to become competent in the German language. This competence is normally demonstrated by successful completion of German 304. The placement in language courses of German majors who have done no language work at Cornell will be determined by the level of preparation they have obtained elsewhere. For details, please consult the major adviser, Mr. Connor. All German majors, particularly those who have had no German prior to coming to Cornell, are encouraged to spend at least part of their junior year abroad.

THE HONORS PROGRAM. The Honors program in German is open to superior students who wish to work independently in an area of their own choice. The student is free to select any member of the field of German to assist him in designing his Honors program, to supervise his work and to help him select a suitable topic for an Honors essay. The Independent Study courses 451-452 may form part of the program.

DISTRIBUTION REQUIREMENT. The Distribution requirement in the Humanities is satisfied in German by German literature courses on the 200 level and above if these courses are not used in fulfillment of the language requirement.

Of the courses listed below, those dealing with literature are staffed and administered by the Department of German Literature, and inquiries in regard to them ought to be addressed to that Department (172 Goldwin Smith Hall).

The courses dealing with language and linguistics are offered by the Division of Modern Languages, and administered by that Division (136 Morrill Hall).

LANGUAGE AND LINGUISTICS

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. Students who have previously studied German should consult p. 12 before registering for this course. Drill, M-F 8, 10:10, 11:15, 12:20; lecture, M W 9:05.

131-132. ELEMENTARY READING COURSE I

Throughout the year. Credit three hours a term. M W F 8, 10:10, 11:15, 12:20, 2:30, 4:40, or 7:30 P.M., or T Th S 8, 9:05, 10:10; lecture, M 11:15, T 11:15, or 7:30 P.M., W 11:15, or F 2:30 or 4:40. (4:40 sections for graduate students only.)

133-134. ELEMENTARY READING COURSE II

Throughout the year. Credit three hours a term. Prerequisite, German 132 or the equivalent. M W F 10:10 or T Th S 8 or 12:20; lecture, T 9:05.

203. INTERMEDIATE COMPOSITION AND CONVERSATION

Either term. Credit three hours. Prerequisite, Qualification in German (for definition of Qualification see p. 12). Fall term: M W F 9:05 or 10:10; lecture, F 2:30. Spring term: M W F 12:20. Miss Augsburg.

Guided conversation and oral and written composition, with special attention to accurate and idiomatic expression in German.

204. INTERMEDIATE COMPOSITION AND CONVERSATION

Either term. Credit three hours. Prerequisite, German 203 or consent of the instructor. Fall term: M W F 12:20; spring term: M W F 9:05 or 10:10. Miss Augsburg.

Continuation of the work of German 203. Emphasis is placed on increasing the student's active vocabulary and command of grammatical patterns.

303-304. ADVANCED COMPOSITION AND CONVERSATION

Throughout the year. Credit four hours a term. Prerequisite, German 204 or consent of the instructor. T Th S 11:15.

Emphasis is placed on increasing the student's oral and written command of German. Detailed study of present-day syntax and different levels of style.

401-402. HISTORY OF THE GERMAN LANGUAGE

Throughout the year. Given in alternate years. Credit four hours a term. Prerequisites, German 204 and Linguistics 201, or consent of the instructor. M W F 11:15. Fall term, Mr. Kufner; spring term, Mr. Lowe.

403. LINGUISTIC STRUCTURE OF GERMAN

Fall term. Credit four hours. Prerequisites, German 204 and Linguistics 201, or consent of the instructor. M W F 10:10. Mr. Jones.

A descriptive analysis of present-day German, with emphasis on its phonetics, phonemics, morphology, and syntax.

404. GERMAN FOR TEACHERS

Spring term. Credit four hours. Required for provisional New York State teacher certification. Prerequisite, German 403. M W F 10:10. Mr. Kufner.

Methods of teaching the language based on a contrastive study of the structures of English and German. Extensive outside reading, reports on textbooks, discussion of various teaching aids and realia.

[501. INTRODUCTION TO GERMANIC LINGUISTICS]

Fall term. Credit four hours. Given in alternate years. Prerequisite, Linguistics 201. W 1:25. Mr. van Coetsem. Not offered in 1969-70.

[502. GOTHIC]

Spring term. Credit four hours. Given in alternate years. Prerequisite, Linguistics 201. W 1:25. Mr. van Coetsem. Not offered in 1969-70.

503-504. OLD SAXON, OLD HIGH GERMAN, OLD LOW FRANCONIAN, OLD FRISIAN

Throughout the year. Credit four hours a term. Given in alternate years. Prerequisite, Linguistics 201. M W F 3:35. Mr. van Coetsem.

509. OLD NORSE I

Fall term. Credit four hours. Hours to be arranged. Mr. Bjarnar.

510. OLD NORSE II

Spring term. Credit four hours. Hours to be arranged. Mr. Bjarnar.

511. SAGAS

Fall term. Credit four hours. Prerequisite, German 510 or consent of the instructor. Hours to be arranged. Mr. Lowe.

512. EDDA

Spring term. Credit four hours. Prerequisite, German 510 or consent of the instructor. Hours to be arranged. Mr. Lowe.

651-652. SEMINARS IN GERMANIC LINGUISTICS

Throughout the year, subject to the needs of students and to the limitations of staff time. Credit four hours. Hours to be arranged. Various staff members.

Seminars will be set up in a variety of topics which may include the following: Comparative Germanic Linguistics, Typology of the Germanic Languages, Primitive Nordic, Runology, Computational Research on Modern German, Transformational Analysis of German, German Dialectology, Dutch Dialectology, Modern Frisian, and other topics.

LITERATURE

FRESHMAN SEMINAR IN GERMAN LITERATURE

(German 103-104)

Credit three hours a term. Mr. Connor and staff.

For description see Freshman Humanities Program, p. 36.

105-106. ELEMENTARY GERMAN FOR LITERARY STUDIES

Credit three hours a term. Hours to be arranged.

Designed for students simultaneously enrolled in the FRESHMAN SEMINAR IN GERMAN LITERATURE.

201-202. INTRODUCTION TO GERMAN LITERATURE

The aim is to introduce the student to German literature through the reading of complete texts mainly from the nineteenth and twentieth centuries. The course is so designed that the student will increase his reading knowledge of German while developing a critical approach to literature. English will be used as much as necessary at the beginning; as the term progresses, classes will be conducted more and more in German. 201 is not a prerequisite for 202. Prerequisite for 201 or 202, Qualification in German (for definition of Qualifications see p. 12).

201. Either term. Credit three hours. Fall term: M W F 8, 9:05, or 11:15 or T Th S 9:05 or 10:10. Spring term: M W F 9:05, or 11:15 or T Th S 9:05 or 11:15. Messrs. Connor, Dallett, Deinert, and staff.

Topic: The German drama. The main emphasis of the course will be on dramatic works by Frisch, Dürrenmatt, Brecht, Hofmannsthal, Büchner and Schiller.

202. Either term. Credit three hours. Fall term: M W F 9:05 or T Th S 9:05 or 11:15. Spring term: M W F 9:05 or 10:10; or T Th S 9:05 or 10:10. Messrs. Connor, Dallett, Deinert, and staff.

Topic: Nineteenth- and twentieth-century prose. The course will deal with complete prose works by Dürrenmatt, Kafka, Mann, Hofmannsthal, Hauptmann, Keller, and Kleist.

[352. LESSING AND THE ENLIGHTENMENT]

Spring term. Credit four hours. Prerequisite, German 201-202 or consent of the instructor. M W F 9:05. Mr. Connor. Not offered in 1969-70.

[354. SCHILLER UND DIE DEUTSCHE KLASSIK]

Fall term. Credit four hours. Prerequisite, German 201-202 or consent of the instructor. T Th S 9:05. Not offered in 1969-70.

[355. THE YOUNG GOETHE]

Fall term. Credit four hours. Prerequisite, German 201-202 or consent of the instructor. M W F 10:10. Mr. Blackall. Not offered in 1969-70.

[356. THE LATER GOETHE]

Spring term. Credit four hours. Prerequisite, German 201-202 or consent of the instructor; 355 recommended. M W F 12:20. Mr. Blackall. Not offered in 1969-70.

357. ROMANTICISM

Fall term. Credit four hours. Prerequisite, German 201-202 or consent of the instructor. M W F 12:20. Mr. Blackall.

German literature in the first half of the nineteenth century, with special reference to the Romantic movement itself and its effect on the period 1830-1850.

358. NINETEENTH CENTURY REALISM

Spring term. Credit four hours. Prerequisite, German 201-202 or consent of the instructor. T Th S 9:05. Mr. Deinert.

This course will be conducted in German.

359. GERMAN EXPRESSIONISM

Fall term. Credit four hours. Prerequisite, German 201-202 or consent of the instructor. M W F 9:05. Mr. Connor.

362. GERMAN LYRIC POETRY

Spring term. Credit four hours. Prerequisite, German 201-202 or consent of the instructor. M W F 9:05. Mr. Dallett.

The unique achievements of twelve major poets from the Baroque Age to the present.

405. INTRODUCTION TO MIDDLE HIGH GERMAN

Fall term. Credit four hours. Prerequisite, consent of the instructor. M W F 1:25.

Intended for students with no previous knowledge of Middle High German; will begin with study of the Middle High German language and then proceed to the reading of selected texts.

[410. TOPICS IN CLASSICISM AND ROMANTICISM]

Spring term only. Credit four hours. Prerequisite, consent of the instructor. T Th 11:15. Not offered in 1969-70.

[411. MODERN GERMAN LITERATURE]

Fall term. Credit four hours. M W F 11:15. Mr. Deinert. Not offered in 1969-70.

[412. MODERN DRAMATISTS]

Spring term. Credit four hours. M W F 10:10. Mr. Connor. Not offered in 1969-70.

[413-414. TOPICS IN MODERN GERMAN LITERATURE]

Credit four hours a term. Prerequisite, consent of the instructor. Fall term: T Th 11:15. Spring term: T Th 11:15. Not offered in 1969-70.

[415. BIBLIOGRAPHY AND METHODS]

Fall term. Credit four hours. Prerequisite, consent of the instructor. M W F 3:35. Not offered in 1969-70.

417-418. THE GREAT MOMENTS OF GERMAN LITERATURE

Throughout the year. Credit four hours a term. Hours to be arranged. Mr. Blackall.

The course is recommended for graduate students and undergraduates, whether majoring in German or not, who wish to acquire an overall view of the whole range of German literature from the earliest texts to the present day. The only prerequisite will be a reading knowledge of German. Two weekly lectures will aim at a characterization of the temper of a period or of the essential nature of a certain writer. A discussion period will concentrate on individual works illustrative of the topics of the lectures.

451-452. INDEPENDENT STUDY

Either term. Credit four hours a term. Staff.

Extensive reading of texts supplementary to regular course work, under the direction of a member of the department.

THE NOVEL IN THE ROMANTIC PERIOD

(Comparative Literature 466)

521. MIDDLE HIGH GERMAN LITERATURE I

Fall term. Credit four hours. Prerequisite, German 405 or consent of the instructor. T 1:25-3:20.

Topic: to be announced.

522. MIDDLE HIGH GERMAN LITERATURE II

Spring term. Credit four hours. Prerequisite, German 405 or consent of the instructor. T 1:25-3:20.

Topic: to be announced.

[523. GERMAN LITERATURE OF THE LATE MIDDLE AGES]

Fall term. Credit four hours. M 1:25-3:20. Mr. Dallett. Not offered in 1969-70.

[525. SIXTEENTH-CENTURY GERMAN LITERATURE]

Fall term. Credit four hours. W 2:30-4:25. Mr. Dallett. Not offered in 1969-70.

527. SEVENTEENTH-CENTURY GERMAN LITERATURE

Fall term. Credit four hours. W 1:25-3:20. Mr. Dallett.

Topic: The Baroque novel, its antecedents and its legacy.

[530. EIGHTEENTH-CENTURY LITERATURE OTHER THAN GOETHE]

Spring term. Credit four hours. T 1:25-3:20. Not offered in 1969-70.

[531. GOETHE]

Fall term. Credit four hours. Th 1:25-3:20. Mr. Blackall. Not offered in 1969-70.

[533. GERMAN ROMANTICISM]

Fall term. Credit four hours. M 2:30-4:25. Mr. Blackall. Not offered in 1969-70.

535. NINETEENTH-CENTURY GERMAN LITERATURE

Fall term. Credit four hours. W 2:30-4:25. Mr. Deinert.

Topic: The drama.

538. TWENTIETH-CENTURY GERMAN LITERATURE

Spring term. Credit four hours. Th 2:30-4:25. Mr. Deinert.

Topic: Hauptmann and Brecht.

[540. HISTORY AND METHODS OF MODERN GERMAN LITERARY CRITICISM]

Spring term. Credit four hours. Not offered in 1969-70.

542. HUGO VON HOFMANNSTHAL

Spring term. Four hours credit. W 2:30-4:25. Mr. Blackall.

TOPICS IN MODERN LITERATURE

(Comparative Literature 501-502)

653-654. SEMINAR IN GERMAN LITERATURE

Throughout the year. Credit four hours a term. Hours to be arranged. Staff.

Hindi

Messrs. G. H. Fairbanks, J. W. Gair, G. B. Kelley, and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. Drill, M-F at 9:05; lecture, T Th 10:10.

201-202. HINDI READING

Throughout the year. Credit three hours a term. Prerequisite for 201, Qualification in Hindi; for 202, Hindi 201 or consent of the instructor. Hours to be arranged.

203-204. COMPOSITION AND CONVERSATION

Throughout the year. Credit three hours a term. Prerequisite for 203, Qualification in Hindi; for 204, Hindi 203 or consent of the instructor. Hours to be arranged.

301-302. READINGS IN HINDI LITERATURE

Throughout the year. Credit four hours a term. Prerequisite, Hindi 202. Hours to be arranged.

303-304. ADVANCED COMPOSITION AND CONVERSATION

Throughout the year. Credit four hours a term. Prerequisite, Hindi 204. Hours to be arranged.

305-306. ADVANCED HINDI READINGS

Throughout the year. Credit four hours a term. Prerequisite, Hindi 202. Hours to be arranged.

Intended for those who wish to do readings in history, government, economics, etc., instead of literature.

[401. HISTORY OF HINDI]

Fall term in alternate years. Credit four hours. Prerequisites, Hindi 101-102 or equivalent and Linguistics 202. Hours to be arranged. Mr. Fairbanks. Not offered in 1969-70.

600. SEMINAR IN HINDI LINGUISTICS

(See also Linguistics 331, 432, 521, 522, 530, 531, 532, 534.)

Either term. Credit three hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Fairbanks, Mr. Gair, or Mr. Kelley.

Indonesian

Messrs. J. M. Echols, J. U. Wolff, and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. Hours to be arranged.

201-202. INDONESIAN READING

Throughout the year. Credit three hours a term. Prerequisite for 201, Qualification in Indonesian; for 202, Indonesian 201 or consent of the instructor. Hours to be arranged.

203-204. COMPOSITION AND CONVERSATION

Throughout the year. Credit three hours a term. Prerequisite for 203, Qualification in Indonesian; for 204, Indonesian 203 or consent of the instructor. Hours to be arranged.

301. READINGS IN INDONESIAN AND MALAY

Either term. Credit four hours. Prerequisite, Indonesian 201-202 or the equivalent. Hours to be arranged.

302. READINGS IN INDONESIAN AND MALAY

Either term. Credit four hours. Prerequisite, Indonesian 301. Hours to be arranged.

303-304. ADVANCED INDONESIAN CONVERSATION AND COMPOSITION

Throughout the year. Credit four hours a term. Prerequisite, Indonesian 204 or the equivalent. Hours to be arranged.

305-306. ADVANCED READINGS IN INDONESIAN AND MALAY LITERATURE

Throughout the year. Credit four hours a term. Prerequisite, Indonesian 302 or consent of the instructor. Hours to be arranged.

403. LINGUISTIC STRUCTURE OF INDONESIAN

Either term. Credit four hours. Prerequisites, Indonesian 101-102 or the equivalent, and Linguistics 201. Hours to be arranged. Mr. Wolff.

MALAYO-POLYNESIAN LINGUISTICS

(See Linguistics 573-574)

Italian

Messrs. G. P. Biasin, Mrs. Anita Grossvogel, Mr. R. A. Hall, Jr., and staff.

For a major in Italian, consult Mr. Biasin and Mr. Hall.

LANGUAGE AND LINGUISTICS

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. Drill, M-F at 8, 12:20, or 1:25; lecture, T Th 10:10.

131-132. ELEMENTARY READING COURSE

Throughout the year. Credit three hours a term. M W F 2:30.

203-204. COMPOSITION AND CONVERSATION

Throughout the year. Credit three hours a term. Prerequisite, Qualification in Italian. T Th 1:25-3.

304. ADVANCED COMPOSITION AND CONVERSATION

Given as required. Credit two to four hours. Prerequisite, Italian 204. Hours to be arranged.

[431. STRUCTURE OF ITALIAN]

Fall term in alternate years. Credit four hours. Prerequisite, Qualification in Italian. M W F 9:05. Mr. Hall. Not offered in 1969-70.

[432. ITALIAN DIALECTOLOGY]

Spring term in alternate years. Credit four hours. M W F 9:05. Mr. Hall. Not offered in 1969-70.

[433. OLD ITALIAN TEXTS]

Fall term in alternate years. Credit four hours. Prerequisite, consent of the instructor. M W F 9:05. Mr. Hall. Not offered in 1969-70.

435. HISTORY OF THE ITALIAN LANGUAGE

Fall term in alternate years. Credit four hours. Prerequisites, Qualification in Italian and Linguistics 201. M W F 9:05. Mr. Hall.

600. SEMINAR IN ITALIAN LINGUISTICS

Offered in accordance with student needs. Credit four hours. Mr. Hall.

LITERATURE

201. INTRODUCTION TO ITALIAN LITERATURE

Fall term. Credit three hours. Prerequisite, qualification in Italian.

[361-362. THE MODERN ITALIAN NOVEL]

Throughout the year. Credit four hours a term. T Th 3:35-5. Mr. Biasin. Not offered in 1969-70.

363-364. MODERN ITALIAN POETRY

Throughout the year. Credit four hours a term. T Th 2:30. Mr. Biasin.

An analysis of selections from Giovanni Pascoli and Gabriele D'Annunzio. In Italian.

[457. EUGENIO MONTALE]

Fall term. Credit four hours. Prerequisite, consent of the instructor. W 2:30. Mr. Biasin. Not offered in 1969-70.

460. GIOVANNI VERGA

Spring term. Credit four hours. Prerequisite, consent of the instructor. W 2:30-4:30. Mr. Biasin.

An analysis of Verga's work with relation to its historical and cultural significance. In Italian.

481. ITALO SVEVO

Fall term. Credit four hours. Prerequisite, consent of the instructor. W 2:30-4:30. Mr. Biasin.

An analysis of the Triestine writer's complete work. In Italian.

Japanese

Mr. J. McCoy, Mrs. Etsuko Terasaki, and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. M-F 2:30 and W 1:25.

201-202. INTERMEDIATE JAPANESE

Throughout the year. Credit four hours a term. Prerequisite, Japanese 102. M-F 1:25.

301-302. SELECTED READINGS IN JAPANESE

Throughout the year. Credit four hours a term. Prerequisite, Japanese 201-202 or consent of the instructor. Hours to be arranged. Mrs. Terasaki.

305-306. INTRODUCTION TO CLASSICAL JAPANESE

Throughout the year. Credit four hours a term. Prerequisite, Japanese 301-302 or consent of the instructor. Hours to be arranged. Mrs. Terasaki.

[401-402. JAPANESE READING FOR STUDENTS OF CHINESE]

Throughout the year in alternate years. Credit three hours a term. Prerequisite, reading knowledge of Chinese and consent of the instructor. M W F 2:30. Mr. McCoy. Not offered in 1969-70.

[404. LINGUISTIC STRUCTURE OF JAPANESE]

Spring term in alternate years. Credit four hours. Prerequisites, Japanese 102 or consent of the instructor, and Linguistics 201. M W F 2:30. Mr. McCoy. Not offered in 1969-70.

405-406. ADVANCED READINGS IN JAPANESE

Throughout the year. Credit four hours a term. Prerequisite, Japanese 302 or consent of the instructor. Hours to be arranged. Staff.

Topics will be selected on the basis of student needs.

Javanese

Messrs. J. M. Echols, J. U. Wolff, and staff.

131-132. ELEMENTARY COURSE

Throughout the year. Credit three hours a term. Prerequisite, Qualification in Indonesian. Hours to be arranged.

133-134. INTERMEDIATE COURSE

Throughout the year. Credit three hours a term. Prerequisite, Javanese 132 or the equivalent. Hours to be arranged.

Linguistics

Messrs. F. B. Agard, L. J. Benoit, N. C. Bodman, M. B. Civera, J. M. Cowan, C. L. Eastlack, J. M. Echols, C. E. Elliott, G. H. Fairbanks, F. A. Foos, J. W. Gair, J. E. Grimes, R. A. Hall, Jr., C. F. Hockett, R. B. Jones, Jr., R. L. Jones, G. B. Kelley, H. L. Kufner, R. L. Leed, A. G. Lozano, P. Lowe, Jr., J. McCoy, J. S. Noblitt, H. M. Olmsted, R. M. Quinn, M. D. Saltarelli, G. F. Sheldon, D. F. Solá, D. S. Stark, F. van Coetsem, J. U. Wolff, and staff.

LINGUISTICS MAJOR. The major in linguistics has three prerequisites: (1) Linguistics 201-202; (2) Qualification in two languages, one from the familiar European group (Latin, Greek, French, Italian, Portuguese, Spanish, German, Russian) and one from the other languages offered at Cornell, with six hours beyond Qualification in one or the other of these two; (3) a two-semester sequence in a related discipline (e.g. the literature of the language in which six hours beyond Qualification was offered as a prerequisite, anthropology, computer science, mathematics, philosophy, psychology, or sociology). Completion of the major requires: (1) Linguistics 301, 303, 304; (2) a course in historical linguistics, either a course in historical method such as Linguistics 502 or the history of a specific language or family; (3) a minimum of eight additional hours in linguistics chosen in consultation with the adviser. Prospective majors should see Mr. Gair.

DISTRIBUTION REQUIREMENT. Linguistics 201-202 satisfies the Distribution requirement in the social sciences.

201-202. INTRODUCTION TO THE SCIENTIFIC STUDY OF LANGUAGE

Throughout the year. Credit three hours a term. Lecture, M W 9:05, 10:10, or 11:15; discussion, F 9:05, 10:10, or 11:15, or Th 1:25. Messrs. Eastlack, Kelley, Kufner, Wolff.

An introductory survey course designed to acquaint the student with the nature of human language and with its systematic study.

207. PRACTICAL PHONETICS

Fall term. Credit three hours. Prerequisite, Linguistics 202. M W 3:35-4:50. Mr. Grimes and Mr. Hockett.

301-302. THE STRUCTURE OF ENGLISH

Throughout the year. Credit four hours a term. M W F 11:15. Mr. Elliott and staff.

Modern structural analysis of English in the first term. In the second term, comparative analysis using the various contrastive sketches of English and other languages recently published. Emphasis will be on the teaching of English as a second language.

303. PHONOLOGY

Fall term. Credit four hours. Prerequisite, Linguistics 201. T Th 3:35-4:50. Mr. Grimes.

304. MORPHOLOGY

Spring term. Credit four hours. Prerequisite, Linguistics 201. T Th 3:35-4:50. Mr. Grimes.

305. LANGUAGE STRUCTURES

Fall term. Credit four hours. Prerequisite, Linguistics 201 or the equivalent, and consent of the instructor. T Th 11:15-1:10. Mr. Grimes or Mr. Hockett.

306. SYNTAX

Spring term. Credit four hours. Prerequisite, consent of the instructor. T Th 11:15-1:10. Mr. Solá.

331. INDIA AS A LINGUISTIC AREA

Fall term in alternate years. Credit four hours. Prerequisite, Linguistics 202. Hours to be arranged. Mr. Fairbanks, Mr. Gair, Mr. Kelley.

403-404. ANALYTICAL TECHNIQUES

Throughout the year. Credit four hours a term. Prerequisite, Linguistics 201-202. M W F 10:10. Mr. Hockett and staff.

A practical training course in the techniques of observation and analysis of descriptive linguistics.

[406. DIALECTOLOGY]

Spring term. Credit four hours. W 1:25-3:20. Mr. Hall. Not offered in 1969-70.

413-414. LINGUISTIC DATA PROCESSING

Throughout the year. Credit two hours a term. Prerequisite, Linguistics 201 and consent of the instructor. T Th 1:25; laboratory hour to be arranged. Mr. Kelley.

432. INDO-ARYAN STRUCTURES

Spring term in alternate years. Credit four hours. Prerequisite, Linguistics 201. Hours to be arranged. Mr. Fairbanks.

436. DRAVIDIAN STRUCTURES

Spring term in alternate years. Credit four hours. Prerequisite, Linguistics 201. Hours to be arranged. Mr. Kelley.

[441-442. HISTORY OF THE ROMANCE LANGUAGES]

Throughout the year in alternate years. Credit four hours a term. T Th 1:25-2:40. Mr. Hall. Not offered in 1969-70.

443-444. COMPARATIVE ROMANCE LINGUISTICS

Throughout the year in alternate years. Credit four hours a term. T Th 1:25-2:40. Mr. Hall.

[445. PROBLEMS AND METHODS IN ROMANCE LINGUISTICS]

Fall term every third year. Credit four hours. W 1:25-3:20. Mr. Hall. Not offered in 1969-70.

[446. ROMANCE DIALECTOLOGY]

Spring term every third year. Credit four hours. M W F 9:05. Mr. Hall. Not offered in 1969-70.

[449. AREAL TOPICS IN ROMANCE LINGUISTICS]

Fall term every third year. Credit four hours. Course may be repeated. M W F 11:15. Mr. Hall. Not offered in 1969-70.

502. COMPARATIVE METHODOLOGY

Spring term in alternate years. Credit four hours. Prerequisite, Linguistics 201-202. Th 1:25-3:20. Mr. Fairbanks.

504. HISTORY OF LINGUISTICS

Spring term. Credit four hours. Prerequisite, consent of the instructor. W 1:25-3:20. Mr. Hall.

505. LITERATURE, LANGUAGE, AND CULTURE

Fall term. Credit four hours. W 1:25-3:20. Mr. Hall.

[506. PIDGIN AND CREOLE LANGUAGES]

Spring term. Credit four hours. M W F 11:15. Mr. Hall. Not offered in 1969-70.

507-508. FIELD METHODS AND LINGUISTIC TYPOLOGY

Throughout the year. Credit four hours a term. Prerequisite for 507, Linguistics 404. M W F 9:05. Mr. R. B. Jones, Jr.

511-512. ACOUSTICAL PHONETICS

Throughout the year. Credit four hours a term. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Cowan.

A rapid survey of experimental articulatory phonetics; the speech mechanism as a sound generator; sound spectrography; psychophysiology of hearing, application of acoustical analysis to the study of speech sounds. Requires no mathematical training beyond arithmetical computation.

513-514. TRANSFORMATIONAL ANALYSIS

Throughout the year. Credit four hours a term. T Th 10:10-12:05. Mr. Saltarelli.

An introduction to the theory, literature, and practice.

[515-516. SOCIOLINGUISTICS]

Throughout the year in alternate years. Credit four hours a term. Prerequisite, consent of the instructor. Hours to be arranged. Not offered in 1969-70.

[521-522. COMPARATIVE INDO-EUROPEAN LINGUISTICS]

Throughout the year in alternate years. Credit four hours a term. Prerequisite,

consent of the instructor. Hours to be arranged. Mr. Fairbanks. Not offered in 1969-70.

[530. ELEMENTARY PALI]

Either term as needed. Credit three hours. Hours to be arranged. Mr. Gair. Not offered in 1969-70.

531-532. ELEMENTARY SANSKRIT

Throughout the year in alternate years. Credit three hours a term. T 1:25-3:20. Mr. Fairbanks.

[534. COMPARATIVE INDO-ARYAN]

Spring term in alternate years. Credit four hours. Prerequisite, Linguistics 202 and 102 or equivalent of an Indo-Aryan language. Hours to be arranged. Mr. Fairbanks. Not offered in 1969-70.

[536. COMPARATIVE DRAVIDIAN]

Spring term in alternate years. Credit four hours. Prerequisite, Linguistics 202 and 102 or equivalent of a Dravidian language. Hours to be arranged. Mr. Kelley. Not offered in 1969-70.

[537-538. OLD JAVANESE]

Throughout the year. Credit four hours a term. Hours to be arranged. Mr. Echols. Not offered in 1969-70.

561-562. COMPARATIVE SLAVIC LINGUISTICS

Throughout the year in alternate years. Credit four hours a term. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Foos.

571-572. SEMINAR IN SOUTHEAST ASIAN LANGUAGES

Throughout the year. Credit four hours a term. Prerequisites, Linguistics 201-202 and consent of the instructor. Hours to be arranged. Mr. R. B. Jones, Jr.

Descriptive and comparative studies of mainland Southeast Asian languages are dealt with in alternate terms. Topics may be selected in accordance with the interests of the students.

573-574. MALAYO-POLYNESIAN LINGUISTICS

Throughout the year. Credit four hours a term. Prerequisites, Linguistics 201-202 and consent of the instructor. Hours to be arranged. Mr. Wolff.

581-582. SINO-TIBETAN LINGUISTICS

Throughout the year. Credit four hours a term. Prerequisite, Linguistics 201-202 or Chinese 402-403 and consent of the instructor. Th 2:30-4:25. Mr. Bodman.

583. CONTRASTIVE VIETNAMESE AND CHINESE GRAMMAR

Either term. Credit three hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Quinn.

600. SEMINAR

Each term. Admission by permission of the instructor. Hours and credits to be arranged. Various members of the staff.

Subject to the needs of students and to the limitations of staff time, advanced seminars are set up in a wide variety of topics, which, in the past, have

included such as the following: contemporary grammatical theory, applied linguistics in language teaching, applied linguistics in literary training and orthography formation. English grammar, problems and methods of Romance linguistics, Romance linguistic geography, Old Provençal texts, Old Italian texts, problems of Romance genealogy, Romance-based Creoles, German dialects, and field methods in phonology.

615-616. DIRECTED RESEARCH

Related linguistics courses offered in other departments are: Anthropology 520; Classics 421-422, 423, 424; English 383, 501; Philosophy 215, 590, 595; and Psychology 215, 313, 416.

Portuguese

Messrs. F. B. Agard, C. L. Eastlack, and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. M-F 2:30, plus two hours to be arranged.

131-132. ELEMENTARY COURSE

Throughout the year. Credit three hours a term. Prerequisite, Qualification in Spanish and consent of the instructor. M W F 10:10 plus one hour to be arranged.

A basic course designed principally for students majoring in Spanish or interested especially in Portugal or Brazil. Phonology, grammar, listening comprehension, and reading.

203-204. COMPOSITION AND CONVERSATION

Throughout the year. Credit three hours a term. Prerequisite for 203, Qualification in Portuguese; for 204, Portuguese 203 or consent of the instructor. M-F 11:15.

303-304. ADVANCED COMPOSITION AND CONVERSATION

Throughout the year. Credit four hours a term. Prerequisite, Portuguese 204. Hours to be arranged.

305-306. ADVANCED READINGS

Throughout the year. Credit four hours a term. Prerequisite, Portuguese 304. Hours to be arranged.

Designed for students needing further practice in reading Portuguese that is not literary.

Quechua

Mr. D. F. Solá.

133-134. INTERMEDIATE COURSE

Throughout the year. Credit three hours a term. Prerequisites, Qualification in Spanish and Quechua 101S (see *Announcement of the Summer Session*) or comparable experience. T Th 11:15-1:10.

An intermediate course in the Cuzco dialect of Quechua, emphasizing basic auditory comprehension and verbal control.

600. SEMINAR IN QUECHUA LINGUISTICS

Either term. Admission by permission of the instructor. Hours and credits to be arranged. Mr. Solá.

Russian

Miss Patricia Carden, Messrs. F. Foos, G. Gibian, Miss Antonia Glasse, Messrs. B. Glasse, M. Horwitz, Mrs. Augusta L. Jaryc, Messrs. A. Kraft, R. L. Leed, Mrs. Alla Novosilzov, Mr. H. M. Olmsted, and staff.

RUSSIAN MAJOR. Russian majors study Russian language, literature, and linguistics, with emphasis placed in accordance with their specific interests.

It is desirable, although not necessary, for a prospective major to complete Russian 101-102, 201-202, 203-204 as a freshman or sophomore since these courses are prerequisite to most of the junior and senior courses which count toward the major. A student may be admitted to the major upon satisfactory completion of Russian 102 or the equivalent.

Students who elect to major in Russian should consult with Mr. Gibian and Mr. Leed as soon as possible.

For a major in Russian a student will be required to complete: (1) Russian 303-304 or the equivalent; (2) twenty-four hours from 300- and 400-level literature and linguistics courses of which twelve hours must be in literature in the original.

Prospective teachers of Russian in secondary schools should take Linguistics 201 while a freshman or sophomore, followed by Russian 403-404.

THE HONORS PROGRAM. Students taking Honors in Russian undertake individual reading and research, write an Honors essay, and take a comprehensive examination at the end of the senior year.

Of the courses listed below, those dealing with literature are staffed and administered by the Department of Russian Literature, and inquiries in regard to them ought to be addressed to that Department (191 Goldwin Smith).

The courses dealing with language and linguistics are offered by the Division of Modern Languages, and administered by that Division (131 Morrill Hall).

LANGUAGE AND LINGUISTICS**101-102. BASIC COURSE**

Throughout the year. Credit six hours a term. Students who have previously studied Russian should consult p. 12 before registering for this course. Drill, M-F 8, 9:05, 10:10, 11:15, or 12:20; lectures, M W 2:30 or T Th 11:15.

131S-132S, 133S-134S. ELEMENTARY COURSE IN SLAVIC LANGUAGES

Throughout the year. Credit three hours a term. Prerequisite, Qualification in Russian and consent of the instructor. Hours to be arranged. Staff.

In a given year one of the following languages will be offered according to demand: Serbo-Croatian, Bulgarian, Slovenian, Polish, or Czech.

131-132. ELEMENTARY READING COURSE I

Throughout the year. Credit three hours a term. Sections: M W F 8, 11:15, 12:20, or 3:35, or T Th S 11:15; lecture, T 2:30 or W 1:25.

133-134. ELEMENTARY READING COURSE II

Throughout the year. Credit three hours a term. Prerequisite, Russian 132 or the equivalent. Sections: M W F 1:25 or 3:35 or T Th S 11:15 or 12:20; lecture, Th 2:30.

203-204. COMPOSITION AND CONVERSATION

Throughout the year. Credit three hours a term. Prerequisite, Qualification in Russian (for definition of Qualification see p. 12). M W F 10:10, 12:20, 1:25, or 2:30; lecture, T Th 9:05 or 10:10.

303-304. ADVANCED COMPOSITION AND CONVERSATION

Throughout the year. Credit four hours a term. Prerequisite for 303, Russian 204. M W F 11:15 plus one hour to be arranged. Mrs. Jaryc.

Emphasis is placed upon increasing the student's oral and written command of Russian. Advanced grammar, syntax, usage, idiomatic expressions. Oral reports, group discussion, selected readings of classic and Soviet writers.

305-306. ADVANCED READINGS

Throughout the year. Credit four hours a term. Prerequisite, Russian 202. Hours to be arranged. Mrs. Jaryc.

Designed for students needing further practice in reading Russian that is not literary.

[401-402. HISTORY OF THE RUSSIAN LANGUAGE]

Throughout the year in alternate years. Credit four hours a term. Prerequisites, Qualification in Russian and Linguistics 201. M W F 2:30. Mr. Leed. Not offered in 1969-70.

403. LINGUISTIC STRUCTURE OF RUSSIAN

Fall term in alternate years. Credit four hours. Prerequisites, Qualification in Russian and Linguistics 201-202. M W F 2:30. Mr. Leed.

A descriptive study and analysis of Russian linguistic structure, morphology, and syntax.

404. RUSSIAN FOR TEACHERS

Spring term in alternate years. Credit four hours. Prerequisites, Qualification in Russian, Linguistics 201, and Russian 403. M W F 2:30. Mr. Leed.

Methods of teaching the language based on a contrastive study of the structures of English and Russian. Extensive outside reading, reports on textbooks, discussion of various teaching aids and realia. Required for provisional New York State teacher certification.

[501. OLD CHURCH SLAVIC]

Fall term in alternate years. Credit four hours. Hours to be arranged. Mr. Olmsted. Not offered in 1969-70.

[502. OLD RUSSIAN]

Spring term in alternate years. Credit four hours. Hours to be arranged. Mr. Foos. Not offered in 1969-70.

COMPARATIVE SLAVIC LINGUISTICS

(See Linguistics 561-562)

600. SEMINAR IN SLAVIC LINGUISTICS

Offered in accordance with student needs. Credit four hours. Hours to be arranged. Mr. Leed, Mr. Olmsted, or Mr. Foos.

[611. SEMINAR IN RUSSIAN DIALECT GEOGRAPHY]

Fall term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Leed. Not offered in 1969-70.

LITERATURE

201-202. INTRODUCTION TO RUSSIAN LITERATURE

Throughout the year. Credit three hours a term. Prerequisite, Qualification in Russian (for definition of Qualification see p. 12). M W F 10:10 or T Th S 10:10.

RUSSIAN LITERATURE

(Comparative Literature 207-208)

In translation. Throughout the year. Credit three hours a term. M W F 12:20. Miss Carden.

292. SUPERVISED READING IN RUSSIAN LITERATURE

Either term. Variable credit. By invitation of the Department.

THE RUSSIAN NOVEL

(Comparative Literature 367)

In translation. Fall term. Credit four hours. T Th S 9:05.

Turgenev, Tolstoy, Dostoevsky.

SOVIET LITERATURE

(Comparative Literature 368)

In translation. Spring term. Credit four hours. M W F 10:10. Mr. Gibian.

[314. INTELLECTUAL BACKGROUND OF RUSSIAN LITERATURE, 1750-1900]

Spring term. Credit four hours. M W F 11:15. Miss Glasse. Not offered in 1969-70.

331. RUSSIAN POETRY

Fall term. Credit four hours. Prerequisites, Russian 202 and consent of the instructor. T Th 2:30 and one hour to be arranged. Mr. Horwitz.

332. RUSSIAN THEATER AND DRAMA

Spring term. Credit four hours. Hours to be arranged. Miss Glasse.

[334. THE RUSSIAN SHORT STORY]

Spring term. Credit four hours. T Th 2:30 and one hour to be arranged. Prerequisite, Russian 202 and consent of the instructor. Miss Carden. Not offered in 1969-70.

421. SUPERVISED READING AND RESEARCH

Either term. Variable credit. By permission of the Department.

431. RUSSIAN PROSE FICTION

Fall term. Credit four hours. Prerequisites, Russian 332 or 334 or the equivalent, and consent of the instructor. T Th 2:30 and one hour to be arranged. Miss Carden.

432. PUSHKIN

Spring term. Credit four hours. Prerequisite, consent of the instructor. T Th 1:25, and one hour to be arranged. Mr. Horwitz.

[435. GOGOL]

Fall term. Credit four hours. Prerequisites, Russian 332 or 334 or the equivalent, and consent of the instructor. M W F 10:10. Mr. Horwitz. Not offered in 1969-70.

493. HONORS ESSAY TUTORIAL

Either term. Credit four hours.

517. RUSSIAN STYLISTICS

Fall term. Credit four hours. Hours to be arranged. Miss Glasse.

Literary uses of the Russian language. Close examination of texts from various periods and genres. Practical exercises.

518. RUSSIAN STYLISTICS

Spring term. Credit four hours. Hours to be arranged.

[520. STUDIES IN RUSSIAN POETRY]

Spring term. Credit four hours. Hours to be arranged. Not offered in 1969-70.

[521. RUSSIAN LITERATURE FROM THE BEGINNINGS TO 1700]

Spring term. Credit four hours. Reading knowledge of Russian required. Hours to be arranged. Mr. Olmsted. Not offered in 1969-70.

[522. EIGHTEENTH-CENTURY LITERATURE]

Fall term. Credit four hours. Prerequisite, Russian 521 or consent of the instructor. Hours to be arranged. Miss Glasse. Not offered in 1969-70.

523. EARLY NINETEENTH-CENTURY LITERATURE

Either term. Credit four hours. Prerequisite, Russian 522 or consent of the instructor. Hours to be arranged. Miss Glasse.

Topic to be announced.

[534. TOPICS IN RUSSIAN SYMBOLISM]

Spring term. Credit four hours. T 3:35-5:30. Mr. Horwitz. Not offered in 1969-70.

601. INTRODUCTION TO GRADUATE STUDY

Fall term. Credit four hours. T 3:35-5:30. Staff.

Required of all first-year graduate students majoring in Russian literature. Bibliography, methods of literary analysis, stylistics, topics in scholarship.

671. SEMINAR IN TWENTIETH-CENTURY RUSSIAN LITERATURE

Spring term. Credit four hours. Th 3:35-5:30. Topic varies from year to year. Topic to be announced. May be taken repeatedly. Miss Carden.

672. SEMINAR IN NINETEENTH-CENTURY RUSSIAN LITERATURE

Fall term. Credit four hours. Hours to be arranged. Mr. Chalsma.

Sinhalese

Messrs. G. H. Fairbanks, J. W. Gair, and staff.

(See also Linguistics 331, 432, 521, 522, 530, 531, 532, 534.)

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. M-F 9:05 and T Th 10:10.

201-202. SINHALESE READING

Throughout the year. Credit three hours a term. Prerequisite, Qualification in Sinhalese. Hours to be arranged.

203-204. COMPOSITION AND CONVERSATION

Throughout the year. Credit three hours a term. Prerequisite for 203, Sinhalese 101-102; for 204, Sinhalese 203 or consent of the instructor. Hours to be arranged.

Spanish

Messrs. F. B. Agard, C. Bandera, J. S. Bernstein, D. Brenes, Mrs. Amanda Chacona, Messrs. J. Kronik, A. G. Lozano, D. Nasjleti, M. D. Saltarelli, K.-L. Selig, D. F. Solá and staff.

SPANISH MAJOR. The Spanish major is designed to give the student oral control of the language, adequate proficiency in its written expression, and a creditable knowledge of the literature and culture of Spain and Spanish America.

Satisfactory completion of the major should enable the student to meet language requirements for a provisional teaching certificate, to do graduate work in Spanish, or to satisfy government standards for acceptance into training programs of the U.S. State Department and other agencies.

For a major in Spanish the following are to be completed: (1) 311-312 and 303-304 or the equivalent of the latter two courses; (2) twenty-four additional hours in Spanish literature or historical linguistics including at least two 400 level courses; (3) 403.

For acceptance into the major the student must have Spanish 201 and 204 or their equivalent and the approval of the chairman of the Department of Romance Studies and of its adviser. The major adviser for 1969-70 is Mr. Brenes.

DISTRIBUTION REQUIREMENT. The Distribution requirement in the Humanities is satisfied in Spanish by any two of the following courses: Spanish 201, 311, 312; but no course may be counted if it is used in fulfillment of the language requirement.

Of the courses listed below, those dealing with literature are staffed and administered by the Department of Romance Studies, and inquiries in regard to them ought to be addressed to that Department (278 Goldwin Smith).

The courses dealing with language and linguistics are offered by the Division of Modern Languages, and administered by that Division (106 Morrill Hall).

LANGUAGE AND LINGUISTICS

101. BASIC COURSE

Fall term. Credit six hours. Students who have previously studied Spanish should consult p. 12 before registering for this course. Drill, M-F 8, 9:05, 10:10; lecture, M W 2:30.

102. BASIC COURSE

Either term. Credit six hours. Prerequisite, Spanish 101 or its equivalent. Students who have previously studied Spanish should consult p. 12 before registering for this course. Fall term: drill, M-F 8, 9:05; lecture, W F 12:20. Spring term: drill, M-F 8, 9:05, 10:10; lecture, M W 2:30.

131-132. ELEMENTARY READING COURSE I

Throughout the year. Credit three hours a term. M W F 11:15 or 12:20; lecture, T 9:05.

133-134. ELEMENTARY READING COURSE II

Throughout the year. Credit three hours a term. Prerequisite, Spanish 132 or the equivalent. M W F 12:20 or 1:25; lecture, Th 9:05.

203. INTERMEDIATE COMPOSITION AND CONVERSATION

Either term. Credit three hours. Prerequisite, Qualification in Spanish (for definition of Qualification see p. 12). Fall term: M-F 9:05, 10:10, 11:15, or 12:20. Spring term: M-F 8 or 12:20, or 1:25.

Guided conversation, grammar review, and oral and written composition. Emphasis is on increasing the student's oral and written command of Spanish.

204. INTERMEDIATE COMPOSITION AND CONVERSATION

Either term. Credit three hours. Prerequisite, Spanish 203. Fall term: M-F 1:25. Spring term: M-F 9:05, 10:10, 11:15, or 12:20.

The study of advanced grammar. Exercises designed to improve the student's ability to speak, read, and write Spanish.

303-304. ADVANCED COMPOSITION AND CONVERSATION

Throughout the year. Credit four hours a term. Prerequisite, Spanish 204. M-F 10:10.

The study of fundamental aspects of style in standard spoken Spanish; advanced problems in comparative usage in English and Spanish. Frequent oral and written reports in Spanish are required. Extensive reading in current Spanish language publications. The study of fundamental aspects of style in standard written Spanish. Cultural content is oriented to Spain in the fall semester and to Spanish America in the spring semester.

[401-402. HISTORY OF THE SPANISH LANGUAGE]

Throughout the year in alternate years. Credit four hours a term. Prerequisites, Qualification in Spanish, and Linguistics 201. M W F 2:30. Mr. Lozano or Mr. Saltarelli. Not offered in 1969-70.

403. THE GRAMMATICAL STRUCTURE OF SPANISH

Fall term. Credit four hours. Prerequisites, Qualification in Spanish and Linguistics 201. M W F 2:30. Mr. Lozano or Mr. Saltarelli.

Descriptive analysis of the morphological and syntactical structure of present-day standard Spanish.

404. SPANISH FOR TEACHERS

Spring term. Credit four hours. Prerequisites, Qualification in Spanish and Linguistics 201. M W F 2:30. Mr. Lozano or Mr. Saltarelli.

A course in methodology and applied linguistics for prospective teachers of the Spanish language. A survey of current attitudes, methods, materials, and techniques. The application of descriptive linguistics to the organization of lesson material, illustrated mainly through the contrastive study of Spanish and English phonology. Required for provisional New York State teacher certification.

THE COMPARATIVE STUDY OF THE ROMANCE LANGUAGES

(See Linguistics 441-442, 443-444, 445, 446, 449)

600. SEMINAR IN IBERO-ROMANCE LINGUISTICS

Offered in accordance with student needs. Credit four hours. Hours to be arranged.

LITERATURE**201. INTRODUCTION TO SPANISH LITERATURE**

Either term. Credit three hours. Prerequisite, Qualification in Spanish (for definition of Qualification see p. 12). M W F 8 or 2:30; T Th S 9:05. Mr. Brenes and staff.

An intermediate reading course in which Spanish texts of established literary quality are read and analyzed. The purpose is twofold: to develop reading and speaking facility through acquisition of vocabulary and idiom, and to develop methods and habits of critical appreciation of a foreign literature. Class discussion is conducted mainly in Spanish. The literature course which normally follows Spanish 201 is Spanish 311 or 312.

205. THE MODERN SPANISH NOVEL

Fall term. Credit three hours. T Th S 11:15. Mr. Bernstein.

For description see Freshman Humanities Program, p. 38.

206. THE MODERN SPANISH AMERICAN NOVEL

Spring term. Credit three hours. T Th S 11:15. Mr. Bernstein.

For description see Freshman Humanities Program, p. 38.

311-312. MASTERPIECES OF HISPANIC LITERATURE

Throughout the year. Credit four hours a term. Prerequisite, Spanish 201, four years entrance Spanish, or consent of the instructor. May be entered in the second term. M W F 9:05. Mr. Selig. Spring term (312): M W F 9:05; T Th S 9:05, Mr. Brenes and staff.

Reading and discussion of representative works of Spanish and Spanish American literature. Works chosen are read in their entirety. The texts chosen for the first semester are primarily from the Renaissance and the Golden Age. Second semester deals with the nineteenth and twentieth centuries. Class conducted in Spanish.

329. THE NOVEL AND THE MEXICAN REVOLUTION

Fall term. Credit four hours. Prerequisite, Spanish 201 or consent of the instructor. T Th S 12:20. Mr. Bernstein.

Reading and class discussion of works of Azuela, López y Fuentes, Guzmán, Ferretis, and others. Attention will be devoted to the social and political background of the Revolution, and to recent novels on revolutionary topics.

[390. THE POST-CIVIL WAR NOVEL IN SPAIN]

Spring term. Credit four hours. Prerequisite, one 300-level course or consent of the instructor. M W F 10:10. Mr. Kronik. Not offered in 1969-70.

392. MODERN SPANISH AMERICAN POETRY

Spring term. Credit four hours. Prerequisite, a Spanish 300-level literature course or consent of the instructor. T Th S 1:25. Mr. Bernstein.

Reading and discussion of major poets from Darío to Paz.

413. THE EPIC

Spring term. Credit four hours. Prerequisite, a Spanish 300-level literature course or consent of the instructor. M W F 2:30.

Intensive study of medieval epic. The *Cid* and *Fernán González*.

429-430. HONORS WORK IN HISPANIC LITERATURE

Throughout the year. May be entered in the second term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged. Staff.

455. SIXTEENTH-CENTURY SPANISH POETRY

Fall term. Credit four hours. Prerequisite, one 300-level course or consent of the instructor. M W F 1:25. Mr. Selig.

Intensive analysis of selected poetry by Boscán, Garcilaso, Fray Luis de León, and others.

457-458. CERVANTES

Throughout the year. Credit four hours a term. Prerequisite, a Spanish 300-level literature course and consent of instructor. May be entered in the second semester. Hours to be arranged. Mr. Brenes.

Fall term: *Don Quijote* and the *entremeses*. Spring term: the *novelas* and *Persiles*. Class conducted in Spanish.

466. SEVENTEENTH-CENTURY SPANISH POETRY

Spring term. Credit four hours. Prerequisite, one 300-level course or consent of the instructor. M W F 1:25. Mr. Selig.

Intensive analysis of selected poetry by Lope de Vega, Quevedo, and Góngora.

[483. EIGHTEENTH- AND NINETEENTH-CENTURY SPANISH DRAMA]

Fall term. Credit four hours. Prerequisite, one 300-level literature course or consent of the instructor. M W F 10:10. Mr. Kronik. Not offered in 1969-70.

486. CONTEMPORARY SPANISH DRAMA

Spring term. Credit four hours. Prerequisite, a Spanish 300-level literature course and consent of the instructor. T Th 3:35-4:50. Mr. Brenes.

A study of the theater in Spain from 1940 to today. Class conducted in Spanish.

487. NINETEENTH-CENTURY NOVEL

Fall term. Credit four hours. Prerequisite, a Spanish 300-level literature course and consent of instructor. T Th 3:35-4:50. Mr. Brenes.

A study of *costumbrismo* and realism in significant nineteenth century Spanish novels. Class conducted in Spanish.

590. GRADUATE SEMINAR IN SPANISH AMERICAN LITERATURE

Spring term. Credit four hours. Hours to be arranged. Mr. Bernstein.

Modern Mexican literature. Emphasis on literature since 1930, and on the assimilation of the Spanish exiles after 1939, their influence on Mexican writers and on Mexican literary culture.

629. INTRODUCTION TO LITERARY STUDIES

Fall term. Credit four hours. Required of all first-year graduate students in Romance studies. M 2:30 and one hour to be arranged. Mr. Selig.

Swedish

Mr. J. M. Echols and staff.

131-132. ELEMENTARY READING COURSE

Throughout the year. Credit three hours a term. Prerequisite, Qualification in German. Hours to be arranged. Mr. Echols.

Tagalog

Mr. J. U. Wolff and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. Prerequisite, consent of the instructor. Hours to be arranged. Offered according to demand.

201-202. TAGALOG READING

Throughout the year. Credit three hours a term. Prerequisite, Tagalog 102. Hours to be arranged.

403. LINGUISTIC STRUCTURE OF TAGALOG

Either term. Credit four hours. Prerequisite, Linguistics 201. Hours to be arranged. Mr. Wolff.

Telugu

Mr. G. B. Kelley and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. Drill, M-F 9:05; lecture, T Th 10:10.

201-202. TELUGU READING

Throughout the year. Credit three hours a term. Prerequisite, Qualification in Telugu. Hours to be arranged.

(See also Linguistics 331, 436, 536)

Thai

Mr. R. B. Jones, Jr. and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. M-F 9:05, T Th 10:10.

201-202. THAI READING

Throughout the year. Credit three hours a term. Prerequisite for 201, Qualification in Thai; for 202, Thai 201 or consent of the instructor. Hours to be arranged. Mr. Jones.

203-204. COMPOSITION AND CONVERSATION

Throughout the year. Credit three hours a term. Prerequisite for 203, Qualification in Thai; for 204, Thai 203 or consent of the instructor. Hours to be arranged. Mr. Jones.

301-302. ADVANCED THAI

Throughout the year. Credit four hours a term. Prerequisite, Thai 201-202 or the equivalent. Hours to be arranged. Mr. Jones.

Selected readings in Thai writings in various fields.

305-306. THAI LITERATURE

Throughout the year. Credit four hours a term. Prerequisite, Thai 301-302 or consent of the instructor. Hours to be arranged. Mr. Jones.

Reading of some of the significant novels, short stories, and letters written since 1850.

405-406. DIRECTED INDIVIDUAL STUDY

Throughout the year for advanced students. Credit four hours a term. Prerequisite, consent of the instructor. Mr. Jones.

Urdu

Mr. G. H. Fairbanks and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. Drill, M-F at 9:05; lecture, T Th 10:10.

(See also Linguistics 331, 432, 521, 522, 530, 531, 532, 534)

201-202. URDU READING

Throughout the year. Credit three hours a term. Prerequisite, Qualification in Urdu. Hours to be arranged.

Vietnamese

Messrs. R. B. Jones, Jr., R. M. Quinn, and staff.

101-102. BASIC COURSE

Throughout the year. Credit six hours a term. Hours to be arranged.

201-202. VIETNAMESE READING

Throughout the year. Credit three hours a term. Prerequisite for 201, Qualification in Vietnamese; for 202, Vietnamese 201 or consent of the instructor. Hours to be arranged. Mr. Quinn.

203-204. COMPOSITION AND CONVERSATION

Throughout the year. Credit three hours a term. Prerequisite for 203, Quali-

cation in Vietnamese; for 204, Vietnamese 203 or consent of the instructor. Hours to be arranged. Mr. Quinn.

301-302. ADVANCED VIETNAMESE

Throughout the year. Credit four hours a term. Prerequisite, Vietnamese 201-202 or consent of the instructor. Hours to be arranged. Mr. Quinn.

305-306. VIETNAMESE LITERATURE

Throughout the year. Credit four hours a term. Prerequisite, Vietnamese 301-302 or consent of the instructor. Hours to be arranged. Messrs. Jones and Quinn.

Reading of selections from contemporary literature.

405-406. DIRECTED INDIVIDUAL STUDY

Throughout the year for advanced students. Credit four hours a term. Prerequisite, consent of the instructor. Mr. Quinn.

MUSIC

Mr. J. T. H. Hsu, Chairman; Messrs. W. W. Austin, M. Bilson, R. Bloch, E. Carter, W. J. Davis, G. C. Green, D. J. Grout, K. Husa, R. M. Palmer, D. R. M. Paterson, D. M. Randel, H. E. Samuel, T. A. Sokol, M. W. Stith, Miss Barbara Troxell.

Freshman considering music as a possible major or minor field should register for Music 151-152, and should consult the chairman of the Department of Music as early as possible, to make tentative plans for a comprehensive program in accordance with their abilities and previous musical training. The sophomore year is not too late for a decision, provided that during that year the student is enrolled in the appropriate courses. The Distribution requirements should be completed by the end of the sophomore year.

Prerequisites for admission to the major are: Music 151-152, with a grade above C in each part of the final examination (including sight singing and keyboard playing); Music 282; Music 321-322; and participation in one of the musical organizations or ensembles (Music 331 through 338 and 441 through 444).

Required courses for the A.B. degree with a major in music are: Music 351-352; 381-382; 451 or 453; 481; a second year of individual instruction in performance and of participation in a musical organization or ensemble; a course in conducting (Music 462 or 463); and one of the following: 457, 458, or 482.

A large collection of recorded music and scores is housed in the Department of Music, where a number of phonograph listening rooms are available. These facilities may be used by any member of the student body at hours to be announced each term.

Choral and instrumental ensembles are trained and directed by members of the departmental staff each term, and all students who are interested are invited to join one or more of these groups. These ensembles include the Sage Chapel Choir, the Cornell Chorus, the Cornell

University Glee Club, the Bands (Marching Band, Wind Ensemble, Symphonic Band, Brass Ensembles), the Cornell Symphony Orchestra, the Cornell Chamber Orchestra, and Chamber Music groups. For rehearsal hours and conditions for academic credit, see Music 331 through 338 and 441 through 444. Announcements of tryouts for all organizations will be made at the beginning of the fall term.

THE HONORS PROGRAM. Candidates for Honors in music will be designated by the Department at the beginning of the second semester of their junior year. Honors candidates will take Music 401-402 in addition to the courses regularly required for a major. Each candidate will submit an Honors thesis or a composition not later than April 1 of his senior year and will be required to pass a general examination in the theory and history of music not later than May 1 of his senior year.

DISTRIBUTION REQUIREMENT. The Distribution requirement in the expressive arts is satisfied in music by Music 151-152, 213-214, 215-216, 213-321-322, 213 plus any three hours in Courses 331 through 338, or by six hours in any other courses for which a student is qualified and has the approval of the Department.

Music Theory

151-152. THEORY I

Throughout the year. Credit three hours a term. A knowledge of the rudiments of music and some ability to perform are required for admission. Enrollment in the course is provisional pending the demonstration of adequate background and ability in proficiency tests given at the beginning of the term. First term prerequisite to second. M T W Th F 9:05. Mr. Paterson.

Designed for students expecting to major in music and other qualified students. An integrated theory course, prerequisite for all advanced courses in music. Detailed study of the fundamental elements of music: rhythm, scales, intervals, triads; melodic movement, harmonic progression, and introduction to analysis and elementary composition. Drill in aural discrimination, sight singing, and keyboard harmony; rhythmic, melodic, and harmonic dictation; and score reading.

215-216. BASIC TECHNIQUES OF MUSIC

Throughout the year. Credit three hours a term. This course may not be counted toward the requirements for the major in music. Ability to sing on pitch is required for admission; some ability to play an instrument is desirable. First term prerequisite to the second. M T W Th 9:05. Mr. Green.

Study of the fundamental techniques of music. Includes rhythmic, melodic, and harmonic dictation; sight singing; writing of melody and simple four-part harmony; keyboard harmony; and listening to recorded masterpieces. Second term includes introduction to analysis and simple contrapuntal writing for voices and instruments.

351-352. THEORY II

Throughout the year. Credit four hours a term. Prerequisite, Music 152 or the equivalent. First term prerequisite to the second. M W F 10:10 and T Th 2:30. Mr. Green.

Includes advanced harmony and intermediate counterpoint and analysis.

A continuation of Music 151-152, with more advanced drill in the areas specified in the description of that course. Special emphasis on the study of chromatic harmony and contrapuntal writing in two and three voices. There will be analysis of melody and harmony and of some of the fundamental homophonic and contrapuntal forms.

451. TONAL COUNTERPOINT AND ANALYSIS: EIGHTEENTH CENTURY

Fall term. Credit four hours. Prerequisite, Music 352 or the equivalent. M W 12:20 and Th 1:25. Staff.

Advanced problems of contrapuntal writing in three voices. An introduction to invertible counterpoint and fugal writing. Representative works employing the fugal principle will be analyzed with particular attention to those of J. S. Bach.

[453. MODAL COUNTERPOINT AND ANALYSIS]

Fall term. Credit four hours. Prerequisite, Music 352 or equivalent. Not offered in 1969-70.

456. ORCHESTRATION

Spring term. Credit four hours. Prerequisite, Music 352. W 10:10-12:05. Mr. Husa.

A study of the instruments of the orchestra and their use in representative works from 1700 to the present. Scoring for various instrumental groups including large orchestra. Students will occasionally attend rehearsals of the Cornell musical organizations and ensembles.

457-458. COMPOSITION (PROSEMINAR)

Credit four hours a term. Prerequisite, Music 352 or the equivalent. First term not prerequisite to the second. T 2:30-4:30 and one additional hour to be arranged. Messrs. Husa, Green, and Palmer.

Problems of writing in the smaller forms and in various media. Class discussion and performance, with analysis of contemporary works. The basic techniques of composition and their extensions in the twentieth century will be related to individual abilities and needs. Students will be required to attend the Friday afternoon reading sessions of student compositions and occasionally to attend rehearsals of the Cornell musical organizations and ensembles.

[462. ORCHESTRAL CONDUCTING]

Spring term. Credit two hours. Prerequisite, Music 352. Mr. Husa. Not offered in 1969-70.

463. CHORAL CONDUCTING

Fall term. Credit two hours. Prerequisite, Music 352. Th 1:25-3:20. Mr. Sokol.

A study of the techniques of choral music: conducting, score reading, rehearsing, and arranging music for chorus.

464. CHORAL STYLE

Spring term. Credit two hours. Prerequisite, Music 352. Th 1:25-3:20. Mr. Sokol.

A study of the art of choral music. Emphasis on the principal vocal forms and on historical and national performance styles.

Music History

213. THE ART OF MUSIC

Fall term. Credit three hours. T Th 11:15 and one discussion section to be arranged. Mr. Austin and assistants.

A survey of old and new, easy and difficult music, designed to speed up the continuing development of various independent tastes. Frequent short written reports based on listening, beating time, and singing.

214. THE ART OF MUSIC: OPERA

Spring term. Credit three hours. T Th 1:25 and one discussion section to be arranged. Mr. Randel and assistants.

An introduction to opera through the detailed study of three works: Mozart's *Le nozze di Figaro*, Verdi's *Rigoletto*, and Wagner's *Die Meistersinger von Nürnberg*.

218. CHOPIN, CHAIKOVSKY, MUSORGSKY

Spring term. Credit three hours; no prerequisites. Credit four hours; prerequisite, reading knowledge of Russian. Lecture-recital T Th 11:15. Seminar for Russian readers only, M 2:30. Discussion sections to be arranged. Messrs. Austin, Gibian, and staff.

Chief works of the three composers, including symphonies, concertos, and operas are studied through phonograph records. Piano music and chamber music are presented in live performance. The biographical, social, and intellectual contexts of the music are considered in relation to concerns of the present; students' essays may deal with such concerns more than any technical aspect of the music, though techniques are not neglected.

282. INTRODUCTION TO MUSICAL STYLE AND ANALYSIS

Spring term. Credit three hours. Prerequisite, Music 152 or the equivalent. M W F 11:15. Mr. Austin.

A study of the interplay of idiom and structure in various styles through analysis of typical masterpieces.

313. MASTERPIECES OF MUSIC

Fall term. Credit four hours. Prerequisite, consent of the instructor. M 7:30-10:30 P.M. Mr. Grout.

Study of selected works and their historical environment. In 1969 the subject will be *The Symphony* since Beethoven.

314. THE GREAT TRADITION IN MUSIC

Spring term. Credit four hours. Prerequisite, consent of the instructor. M 7:30-10:30 P.M. Mr. Grout.

In 1970 the subject will be the music of J. S. Bach. Study of selected instrumental and vocal works as representative of the Late Baroque.

381-382. HISTORY OF MUSIC I

Throughout the year. Credit four hours a term. Prerequisite, Music 282. First term prerequisite to the second. M 1:25-3:20, W 1:25. Mr. Randel.

History of musical styles from the Middle Ages to Beethoven. Intensive study of musical scores, readings from theoretical sources (in translation), and written reports.

481. HISTORY OF MUSIC II

Fall term. Credit four hours. Prerequisite, Music 382. M 1:25-3:20 and individual conferences. Mr. Grout.

History of musical styles from the time of Beethoven to the present.

482. MUSICOLOGY (PROSEMINAR)

Spring term. Credit four hours. Prerequisite, Music 481. M 1:25-3:20. Mr. Grout.

Principles of research. Introduction to notation, with exercises in transcription from sources and preparation of performing editions.

The Honors Program

401-402. HONORS WORK IN MUSIC

Credit four hours a term. Open only to Honors candidates in their senior year. Mr. Austin and staff.

Musical Performance

321-322. INDIVIDUAL INSTRUCTION IN VOICE, ORGAN, PIANO; STRING, WOODWIND, AND BRASS INSTRUMENTS

Throughout the year. Undergraduate credit only: Music 321, fall term, credit one hour; Music 322, spring term, credit two hours. With special departmental permission, a student may begin Music 321 in the spring term; credit one hour. Consent of the instructor required; students may not preregister.

Basic fee for one half-hour lesson weekly during one term (carrying no credit), \$60. Fees for a practice schedule of six hours weekly during one term: \$20 for the use of a pipe organ; \$10 for a practice room with piano; \$5 for a practice room without piano.

For credit: one hour lesson weekly (or two half-hours) and a double practice schedule carry three hours of credit for two terms, provided that the student has earned or is earning at least an equal amount of credit in courses in music history or music theory. The basic fees involved are then multiplied by one and one half (lesson fee \$90; practice fee \$30, \$15, and \$7.50). A student may register for this course in successive years.

The Department of Music offers a limited number of scholarships in applied music. For information inquire at the Department office.

Musical Organizations and Ensembles

Throughout the year. Credit one hour a term. Consent of the instructor required; admission by audition only. Registration is permitted in two of these courses simultaneously, and students may register in successive years, but no student may earn more than six hours of credit in these courses. Membership in these and other musical organizations is also open to students without credit, if desired.

331-332. SAGE CHAPEL CHOIR

T 4:30-5:30, Th 7:30-9:00 P.M., Sunday 9:30 A.M. Messrs. Paterson and Sokol.

335-336. CORNELL ORCHESTRAS

Rehearsals for the Cornell Symphony Orchestra: W 7:30-10 P.M., full orchestra; alternate T or Th 7:30-10 P.M., sectional rehearsals. Rehearsals for the Cornell Chamber Orchestra; M 7:30-10 P.M. (Limited to more experienced players.) Mr. Husa.

337-338. UNIVERSITY BANDS

During football season: Marching Band, T Th 7:15-9:15 P.M., F 4:30-5:45; Symphonic Band, T Th 4:30-5:45. After football season: Wind Ensemble, T 4:30-5:45, Th 7:15-9:15 P.M.; Symphonic Band, T 7:15-9:15 P.M., Th 4:30-5:45. Mr. Stith.

339-340. EAR TRAINING AND SIGHT SINGING

Throughout the year. Open only to students who are participating in a University musical ensemble. Consent of the instructor is required. T 3:35. Messrs. Sokol and Paterson.

A practical course designed to improve the student's conception of melody and rhythm and his sight reading ability. Progressive class exercises in intervals, rhythms, melodies, and counterpoints.

441-442. CHAMBER MUSIC ENSEMBLE

Hours to be arranged. Consent of the instructor is required. Mr. Hsu.

443-444. CHAMBER SINGERS

F 4:30-6. Consent of the instructor is required. Mr. Sokol.

Study and performance of selected vocal music. Occasionally viols, recorders, and other instruments may be employed.

Graduate Courses and Seminars

Primarily for graduate students. Open to qualified undergraduates with consent of the instructor. For complete descriptions of graduate courses see the *Announcement of the Graduate School: Humanities*.

551. INTRODUCTION TO CONTEMPORARY MUSIC

555. ANALYSIS

557-558. COMPOSITION

581-582. INTRODUCTION TO BIBLIOGRAPHY AND RESEARCH

585-586. DEBUSSY TO BOULEZ

652. CONTEMPORARY MUSIC

681-682. MUSICOLOGY

683-684. PALEOGRAPHY

[685-686. HISTORY OF OPERA]

Not offered in 1969-70.

PHILOSOPHY

Mr. N. Malcolm, Chairman; Messrs. M. Black, S. M. Brown, Jr., C. Chastain, K. S. Donnellan, A. Fine, B. C. Goldberg, H. Ishiguro, J. Kamp, J. Kim, N. Kretzmann, D. B. Lyons, D. Sachs, R. R. K. Sorabji, M. A. G. Stocker, N. L. Sturgeon, G. H. von Wright, and A. Wood.

Students expecting to major in philosophy should begin their systematic study of it in their freshman or sophomore years. For admission to the major, the normal requirement is earning a grade of C or better in a philosophy course above 200. Application for admission is made to the Department of Philosophy.

For the major, eight philosophy courses are required, and these must include (a) Philosophy 201; (b) at least one course in the history of philosophy from among 301, 302, 303, 305, 307; (c) at least two courses numbered above 400. Philosophy majors must also complete at least eight hours of approved courses in related subjects.

THE HONORS PROGRAM. For provisional acceptance as a candidate for Honors, a student must have chosen a philosophy major, a cumulative average of B- for all work in the College of Arts and Sciences and an average of B for courses in philosophy. All candidates for Honors pursue, in their senior year, a program of research (taking Philosophy 490) in either the fall or the spring term leading to the writing of an Honors essay.

DISTRIBUTION REQUIREMENT. The Distribution requirement in the Humanities is satisfied in philosophy by completing any two courses in philosophy, with the following exceptions: (a) Philosophy 100 if used in satisfying the Freshman Humanities requirement; (b) a combination of two introductory courses, 100 and 101; (c) a combination of two courses in formal logic, such as 212, 412, 413, and 419.

Introductory Courses

100. FRESHMAN SEMINAR IN PHILOSOPHY

Either term. Credit three hours. Open only to freshmen who have not taken Philosophy 101. Fall term: M W 2:15-3:30, Messrs. Malcolm and Chastain; T Th 2:15-3:30, Messrs. Sorabji and Lyons. Spring term: M W 2:15-3:30, Mr. Kim; T Th 2:15-3:30, Messrs. Wood and Lyons.

Offered as part of the Freshmen Humanities Program. See p. 37.

101. INTRODUCTION TO PHILOSOPHY

Either term. Credit three hours. Open only to freshmen and sophomores who have not taken Philosophy 100. Registration is limited to thirty students a section. Fall term: M W F 10:10, Mr. Stocker; T Th S 9:05, Mr. Sturgeon; T Th S, 10:10, Mr. Wood; T Th S 12:20, Mr. Goldberg. Spring term: T Th S 9:05, Mr. Kamp; T Th S 10:10, Mr. Sturgeon; M W F 10:10, Mr. Fine; M W F 11:15, Mr. Goldberg; M W F 9:05, Mr. Chastain.

An introduction to philosophical ideas and problems through an intensive study of the writings of several major philosophers.

Courses Primarily for Undergraduates

All 200 and 300 courses in philosophy are designed primarily for undergraduates and are open to sophomores, juniors and seniors except as noted in the course descriptions. 200-level courses generally have no prerequisites. 300-level courses generally have some restrictions which instructors may waive in individual cases. (Graduate students in philosophy may be permitted to enroll in certain 300-level courses by special action of the Department.) Credit for each such course is four hours.

201. ANCIENT PHILOSOPHY

Spring term. Credit four hours. Open to sophomores, juniors and seniors. Required for students majoring in philosophy. T Th S 9:05. Mr. Sorabji.

A study of the treatment of major philosophical problems by philosophers in antiquity, with reference to the influence of their philosophical theories on science and literature.

210. PHILOSOPHICAL PROBLEMS

Either term. Credit four hours. Open to sophomores, juniors, seniors, and freshmen who have taken 100 or 101. Recommended for prospective majors in philosophy. Registration is limited to thirty-five students. Fall term: T Th S 11:15, Mr. Sturgeon. Spring term: M W F 12:20. Mr. Malcolm.

The study of a selected philosophical problem. Contemporary as well as classical sources. Topic for the fall term: Minds, bodies, and machines. Topic for the spring term: The mind-body problem.

212. INTRODUCTION TO LOGIC

Either term. Credit four hours. Open to freshmen, sophomores, juniors, and seniors. Fall term: M W F 12:20, Mr. Fine. Spring term: M W F 11:15, Mr. Chastain.

The analysis and evaluation of reasoning in terms of formalized languages (the sentential calculus and the first-order predicate calculus with identity).

215. SEMANTICS

Spring term. Credit four hours. Open to sophomores, juniors, and seniors. M W F 2:30. Mr. Black.

A survey of the philosophy of language and symbolism. Topics include: the nature of signification and communication, emotive meaning, speech-acts, theories of meaning, semantic fallacies and paradoxes.

223. SOCIAL AND POLITICAL PHILOSOPHY

Spring term. Credit four hours. Open to sophomores, juniors, and seniors. M W F 10:10. Mr. Stocker.

A critical examination of the work in social and political philosophy of such philosophers as Plato, Aristotle, Aquinas, Hobbes, Rousseau, Hegel and Mill.

225. ETHICS

Fall term. Credit four hours. Open to sophomores, juniors, and seniors. M W F 11:15. Mr. Donnellan.

An introduction to problems and theories in moral philosophy with special emphasis on sources of scepticism about the objectivity of moral principles and values.

302. MODERN PHILOSOPHY: EMPIRICISM

Spring term. Credit four hours. Open to sophomores, juniors, and seniors. M W F 11:15. Mr. Donnellan.

A study of the theories of the classical Empiricists—Locke, Berkeley and Hume.

[303. MEDIEVAL PHILOSOPHY]

Not offered in 1969-70.

305. SPECIAL TOPICS IN THE HISTORY OF PHILOSOPHY

Fall term. Credit four hours. Open to sophomores, juniors, and seniors. T Th S 10:10. Miss Ishiguro.

Topic for 1969-1970: Philosophies of mind of Brentano and Sartre.

[307. KANT]

Not offered in 1969-70.

308. CONTEMPORARY PHILOSOPHY

Fall term. Credit four hours. Open to sophomores, juniors, and seniors. M W F 12:20. Mr. Chastain.

Topic for 1969-70: To be announced.

311. EXISTENTIALISM AND PHENOMENOLOGY

Spring term. Credit four hours. Open to sophomores, juniors, and seniors. T Th S 11:15. Mr. Wood.

An examination of selected readings from modern continental philosophers, exploring their radical approach to questions of human perception, understanding, value, decision, and action.

314. INTRODUCTION TO PHILOSOPHY OF MATHEMATICS

Fall term. Credit four hours. Open to sophomores, juniors, and seniors. M W F 10:10. Mr. Fine.

The rudiments of number theory, set theory, and the theory of probability will be examined in an attempt to explore three topics: the nature of mathematical entities, the concept of a 'foundation' for mathematics and the source (empirical or otherwise) of mathematical truth.

316. METAPHYSICS AND EPISTEMOLOGY

Spring term. Credit four hours. Open to sophomores, juniors, and seniors. M W F 12:20. Mr. Goldberg.

An examination of various philosophical antagonisms: materialism-dualism; realism-idealism; platonism-nominalism.

[320. PHILOSOPHY IN LITERATURE]

Not offered in 1969-70.

[321. AESTHETICS]

Not offered in 1969-70.

322. PHILOSOPHY OF RELIGION

Fall term. Credit four hours. Open to sophomores, juniors, and seniors. T Th S 12:20. Mr. Wood.

A survey of philosophical thinking about the nature and justifiability of the beliefs and practices of religion in the Western tradition.

323. LAW, SOCIETY, AND MORALITY

Fall term. Credit four hours. Open to upperclassmen who have had one course in philosophy. T Th S 11:15. Mr. Lyons.

An examination of related problems in moral, legal, and political philosophy, including the nature of morality and of law and the connections between them, justice, rights, equality, punishment, and political obligation.

325. ETHICAL THEORY

Spring term. Credit four hours. Open to upperclassmen who have had one course in philosophy, to others by consent of the instructor. M W F 12:20. Mr. Stocker.

A systematic study of one or more ethical theories. Topic for 1969-70: Ethical relativism.

[327. INTRODUCTION TO PHILOSOPHY OF SCIENCE]

Not offered in 1969-70.

333. PHILOSOPHY OF PSYCHOLOGY

Spring term. Credit four hours. Open to upperclassmen who have had one course in philosophy, to others by consent of the instructor. M W F 10:10. Mr. Malcolm.

A study of theories of mind and behavior in philosophy and modern psychology.

Advanced Courses and Seminars

All 400-level courses in philosophy are designed primarily for advanced undergraduates, philosophy majors and graduate students. All 500-level courses in philosophy are seminars designed primarily for graduate students. 400- and 500-level courses are open to others only by consent of the instructor or as indicated in the course descriptions. Credit for each such course is four hours.

403. PLATO AND ARISTOTLE

Fall term. Credit four hours. Open to upperclassmen and graduate students. T Th S 12:20. Mr. Sorabji.

Topic for 1969-70: To be announced.

412. DEDUCTIVE LOGIC

Fall term. Credit four hours. Prerequisite, Philosophy 212 or the equivalent. M W F 2:30. Mr. Kamp.

The first-order predicate calculus: proof theory and model theory; the completeness theorem. Theories and definitions. Axiomatic set theory: sets, functions, relations, ordinals, cardinals, the recursion theorem.

[413. DEDUCTIVE LOGIC]

Not offered in 1969-70.

414. PHILOSOPHY OF LOGIC

Spring term. Credit four hours. Open to upperclassmen and graduate students. M W F 12:20. Mr. Donnellan.

Philosophical problems connected with logical theory, including meaning and reference; logic and ontology; logic and ordinary language; identity and substitutivity; modal logic.

[417. THEORY OF KNOWLEDGE]

Not offered in 1969-70.

[418. INDUCTIVE LOGIC]

Not offered in 1969-70.

419. INTENSIONAL LOGIC

Spring term. Credit four hours. Prerequisite, Philosophy 412 or the equivalent. T Th S 11:15. Mr. Kamp.

Topics chosen from: Intentional logic, pragmatics, modal logic, tense logic, deontic logic, intuitionistic logic, description theory, and others.

425. CONTEMPORARY ETHICAL THEORY

Fall term. Credit four hours. Open to upperclassmen and graduate students. M W F 11:15. Mr. Stocker.

A critical and systematic study of ethical theory over the last hundred years, with readings from such philosophers as Mill, Moore, Prichard, Ross, Stevenson and Hare.

[427. PROBLEMS IN PHILOSOPHY OF SCIENCE]

Not offered in 1969-70.

433. PROBLEMS IN ETHICS AND PHILOSOPHY OF MIND

Spring term. Credit four hours. Open to juniors, seniors, and graduate students. Prerequisite, two courses in philosophy or consent of the instructor. T Th S 12:20. Mr. Sturgeon.

Selected topics in moral and mental philosophy: moral feelings and attitudes, practical reason, thought and action, intentions, oneself and one's future. Topic for 1969-70: Practical reasons and practical attitudes.

490. SPECIAL STUDIES IN PHILOSOPHY

Either term. Credit four hours. Open only to Honors students in their senior year. Staff.

[551. PHILOSOPHY OF RELIGION]

Not offered in 1969-70.

[576. ANCIENT PHILOSOPHY]

Not offered in 1969-70.

[580. MEDIEVAL PHILOSOPHY]

Not offered in 1969-70.

585. ETHICS AND VALUE THEORY

Spring term. Credit four hours. W 3:35-5:30. Mr. Lyons.

Topic for 1969-70: To be announced.

588. METAPHYSICS

Fall term. Credit four hours. Th 3:35-5:30. Miss Ishiguro.

Topic for 1969-70: Leibniz' logic and philosophy of language.

589. METAPHYSICS

Spring term. Credit four hours. Th 3:35-5:30. Mr. Kim.

Topic for 1969-70: To be announced.

590. PHILOSOPHY OF LANGUAGE

Spring term. Credit four hours. T 3:35-5:30. Mr. Goldberg.

Topic for 1969-70: Justification.

594. THEORY OF KNOWLEDGE

Fall term. Credit four hours. F 3:35-5:30. Mr. Malcolm.

Topic for 1969-70: Explanations of memory.

595. SEMANTICS

Fall term. Credit four hours. M 3:35-5:30. Mr. Black.

Topic for 1969-70: Nelson Goodman's *Languages of Art*.

596. LOGIC

Fall term. Credit four hours. Prerequisite: Philosophy 412 or the equivalent. T 3:35-5:30. Mr. Kamp.

Topic for 1969-70: To be announced.

597. PHILOSOPHY OF SCIENCE

Spring term. Credit four hours. F 3:35-5:30. Mr. Fine.

Topic for 1969-70: Space and time.

PHYSICS

Mr. L. G. Parratt, Chairman; Messrs. V. Ambegaokar, N. W. Ashcroft, B. W. Batterman, K. Berkelman, H. A. Bethe, R. Bowers, A. A. Browman, P. A. Carruthers, D. G. Cassel, G. V. Chester, F. M. Cooper, R. M. Cotts, T. R. Cuykendall, J. P. Delvaille, J. W. DeWire, D. A. Edwards, D. B. Fitchen, K. Gottfried, K. I. Greisen, F. L. Gross, L. N. Hand, D. K. Hartill, P. L. Hartman, D. F. Holcomb, R. L. Imlay, P. M. Joseph, T. Kinoshita, J. A. Krumhansl, A. Kuckes, D. M. Lee, R. M. Littauer, E. C. Loh, H. Mahr, B. W. Maxfield, B. P. McBreen, D. B. McDaniel, N. D. Mermin, N. B. Mistry, A. Molinari, M. Nelkin, H. F. Newhall, J. Orear, J. Peoples, J. Pestieau, R. O. Pohl, J. D. Reppy, T. Rhodin, R. C. Richardson, P. Roy, E. E. Salpeter, B. M. Siegel, A. J. Sievers, J. Silcox, R. H. Silsbee, A. Silverman, P. C. Stein, R. M. Talman, W. W. Webb, D. H. White, J. W. Wilkins, K. G. Wilson, R. R. Wilson, W. M. Woodward, and D. R. Yennie.

Entering freshmen may receive advanced placement and credit for one or two terms of Physics 101-102, 121-122, or 207-208 by demonstrating a high level of physics proficiency in the advanced placement examination administered in the spring by the College Entrance Examination Board, or in a special Cornell examination given just before the start of classes for the fall term. Note that an entering freshman may proceed directly into sophomore physics only if he has also received advanced placement into sophomore calculus. Students who receive advanced placement in the spring for only one term of physics and/or mathematics may advisedly take the second-term course in the Cornell Summer Session (before September admission) in order to be in regular phase.

Physics Major

A student will ordinarily be admitted to a physics-major program, either Option A or B (see below), if he has passed at a good level of pro-

iciency Physics 207–208 (or, with special permission, Physics 101–102) and one year of calculus. The candidate must present a tentative plan acceptable to his prospective major adviser for completing all the requirements for graduation, including those for the major.

TWO MAJOR OPTIONS. Option A is intended primarily for students who plan to pursue graduate studies in a physical or biological science, or otherwise to become professional scientists; Option B is intended primarily for students who have broader interests (less physics specialization at the Bachelor degree level), e.g., for those who plan to pursue graduate studies in a nonscience field, to enter the medical profession, or to teach in precollege programs. The choice of Option B, however, does not preclude a professional career in physics or other natural science if the student elects more than the minimal work required for this option, or if he accepts a prolongation of his period of graduate study.

Option A. Minimal requirements: (a) thirty credit hours of physics courses selected from those indicated by the symbol # in the list below, including (i) two of Physics 310 (or 238), 360, and 410, (ii) Physics 443, and (iii) either Physics 444 or 454; and (b) Mathematics 421 (or 331 and 316); or the equivalent as judged by the student's major adviser. Graduate physics courses (numbered above 499) will not be accepted as substitutes in meeting requirement (a). It is strongly recommended that all students interested in a possible Option A major (who do not have advanced placement) take Physics 207–208 (preferably 208H) and Mathematics 111–122 in the freshman year; and Physics 305, and either 310 or 360, and Mathematics 221–222 in the sophomore year. It is difficult to complete Option A if physics is started in the sophomore year, and possible only if the student has completed freshman calculus before the start of the sophomore year. (He may, of course, take appropriate physics and/or mathematics in the Summer Session, but he should first consult a physics major adviser).

Option B. Minimal requirements: (a) an intermediate course (numbered above 300) in each of the following: mechanics, optics, electricity, experimental physics, and a senior course in modern physics; (b) three credit hours in mathematics beyond Mathematics 213, 221, or 293; and (c) fifteen credit hours in approved courses in the natural sciences with at least six of these fifteen hours in courses numbered above 300. Requirement (c) may be satisfied in part by approved additional physics courses numbered between 300 and 500; and up to six of the fifteen hours (but not more than three of the six numbered above 300) may be in history of science or philosophy of science. In Option B the physics course (Physics 207–208) may be conveniently started in the sophomore year.

Students in either Option A or B who have an interest in eventual graduate work in any science are advised to meet the foreign language requirement (at least Qualification) in a foreign language different from the one offered for admission to the College; and at least one of these two languages should be French, German, or Russian. For Qualification

in a second language, language courses 131-132 are recommended.

A student may be granted Honors in physics upon the recommendation of the Physics-Advisers Committee of the physics faculty.

Distribution Requirement

The distribution requirement in physical sciences is satisfied in physics by Physics 101-102, 201-202, 207-208 (or the first term of any one of these followed by the second term of another) or the six-credit-hour physics seminar in the Six-Year Ph.D. Program mentioned on p. 291. Physics 201-202 is recommended for students who do not intend to take any second-year (or higher) course in a physical or biological science.

101-102. GENERAL PHYSICS

Throughout the year. Credit four hours a term. Prerequisite, three years of college preparatory mathematics. Course 101 (or 207) is prerequisite to 102. Similar to but less analytically demanding than Course 207-208. Students who plan to major in a physical science should preferably elect Physics 207-208. (See also Physics 201-202). Demonstration lectures, M W 9:05 or 11:15. Two discussion hours per week and a two-hour laboratory period on alternate weeks, as assigned. Preliminary examinations will be held at 7:30 P.M. October 15, Nov. 19, Mar. 4, and April 15. Messrs. Greisen, Delvaille, McBreen, Sievers, and staff.

Basic principles of physics, treated quantitatively but without calculus. Topics include motion, dynamics, conservation laws, kinetic theory, gravitational and electromagnetic forces and fields, wave motion and light, relativity, atomic physics, structure of matter, and nuclear physics. Historical and philosophical allusions as time permits. At the level of *An Introduction to the Meaning and Structure of Physics*, 1968, by L. N. Cooper.

121-122. INTRODUCTORY ANALYTICAL PHYSICS I AND II

Throughout the year. Credit three hours a term. (Physics 121 is also offered in the spring term, T Th S 9:05, for those students who have completed but failed the course in the preceding fall term; permission of the instructor is required.) Prerequisite, calculus or coregistration in Mathematics 191-192, or consent of the instructor. Course 121 is prerequisite to 122. Primarily for students of engineering. Lecture, F 9:05 or 11:15 or 1:25. Two discussion periods per week and one two-hour laboratory period every other week, as assigned. Preliminary examinations will be held at 7:30 P.M. on Oct. 14, Nov. 18, Mar. 3, and April 21. Fall term, Messrs. Newhall, Ashcroft, Imlay, Krumhansl, Silcox, Wilkins, and staff. Spring term, Messrs. Newhall, Bowers, Chester, McDaniel, Roy, and staff.

The mechanics of particles: kinematics, dynamics, conservation of energy, conservation of linear momentum, circular motion, special relativity. Rotation of rigid bodies. Harmonic motion. The properties of the fundamental forces: inertial (including gravitational), electromagnetic, and nuclear. At the level of *Introductory Analytical Physics*, fourth edition, by Newhall.

201-202. ASPECTS OF THE PHYSICAL WORLD

Throughout the year. Credit three hours a term. (Not suitable for credit if taken after any two-term college physics course.) Prerequisites, three years of college preparatory mathematics and high school physics or chemistry, or

consent of the instructor. Course 201 is prerequisite to 202. Open to freshmen by special permission only. Students who plan to take a second-year (or higher) physical or biological science course should elect Physics 101-102 or 207-208 instead of this course. Lectures, M W F 2:30. One two-hour laboratory-discussion period per week, as assigned. (Total class time will average about four hours per week.) Fall term, Messrs. Yennie, Cooper, Roy, and Silverman. Spring term, Messrs. Silverman and Cooper.

The central aim is to give nonscience majors some insight into the methods and the results of physics and its neighboring sciences. A set of widely ranging but related topics will be considered, without attempt to survey physics systematically at any level. A diversity of treatment is employed. Typical topics: the nature of space and time, relativity, the solar system and gravitation, atoms and the structure of matter, semiconductor devices, and elementary particles. (See also the Physical Science Seminar in the Six-Year Ph.D. Program mentioned on p. 291. For the fall term, this seminar is in physics, taught by Mr. Mermin.)

207-208. FUNDAMENTALS OF PHYSICS

Throughout the year. Credit four hours a term. Prerequisite, at least co-registration in Mathematics 111-112. High school physics is a normal background and, except for physics Option A majors and mathematics majors, prior completion of Mathematics 111-112 is strongly recommended. Course 207 (or either 101 or 121 with special permission) is prerequisite to 208. Intended as the first college-physics course for most students majoring in a physical science or in mathematics. Demonstration lectures, W F 9:05 or 11:15. Two discussion periods a week and one two-and-one-half-hour laboratory period alternate weeks, as assigned. Preliminary examinations will be held at 7:30 P.M. on Oct. 20, Nov. 24, Mar. 9, and April 20. Fall term, Messrs. Cassel, Fitch, McDaniel, Reppy, and staff. Spring term, Messrs. Gross, Kinoshita, Stein, and staff.

Topics treated during the year include Newton's Laws, conservation of momentum and energy, electricity, magnetism, waves, special relativity, atomic physics (including some wave mechanics), and statistical physics. Emphasis is placed on the fundamental concepts and on the analytical techniques of problem and laboratory work. At the level of *Elementary Classical Physics*, Vols. I and II, 1965, and of *Elementary Modern Physics*, 1960, by Weidner and Sells.

208H. FUNDAMENTALS OF PHYSICS

Spring term. An Honors section of 208. Prerequisites, a request for this course as expressed by the student in consultation with the 208H instructor and an invitation from the instructor. Lectures, W F 9:05 or 11:15. Discussion and laboratory either M W 1:25 and W 2:15-4:25, or T Th 1:25 and T 2:15-4:25. Students interested in 208H should reserve these hours but should pre-register for 208. Evening preliminary examinations as listed in Physics 208. Mr. Hand and staff.

233(A,B)-234(A,B). INTRODUCTORY ANALYTICAL PHYSICS III and IV

Throughout the year. Credit three hours a term. (Physics 233 is also offered in the spring term, T Th S 11:15, for those students who failed the course in the preceding fall term but who passed Physics 235.) Prerequisites, Physics 122 and coregistration in Mathematics 293-294 and in Physics 235-236, or consent of the instructor. Course 233 is prerequisite to 234. Lectures, T Th 9:05 or 11:15. Two discussion periods every week, as assigned. Each term

the course is subdivided into two independent sections, each of no more than 270 students (and for each lecture, no more than 135 students). Preliminary examinations will be held at 7:30 P.M. on Oct. 9, Nov. 6, Dec. 11, Feb. 19, Mar. 19, and Apr. 23. Fall term, Messrs. Orear, Richardson, and staff; spring term, Messrs. Edwards, Littauer, and staff.

Electrostatic fields, potential, fields around conductors and in simple dielectrics, special relativity, charges in motion, time-varying fields, induced electromotive force, energy of charge and current distributions, electrical oscillations and oscillatory behavior in general, electromagnetic waves, polarization, interference and diffraction. Quantum effects, atomic and x-ray spectra, nuclear structure and reactions, particle physics, and solid state physics. At the level of *Electricity and Magnetism*, 1966, by Purcell (Berkeley Physics Course, Vol. 2), of *Introduction to Special Relativity*, 1965, by Smith, and of *Fundamentals of Optics and Modern Physics*, 1968, by Young.

235-236. LABORATORY TO ACCOMPANY PHYSICS 233-234

Throughout the year. Credit one hour a term. Must be taken with Physics 233-234. Course 235 is prerequisite to 236. One two-hour period every week, as assigned. Messrs. Lee, Richardson, and staff.

Experiments include electrical measurements, circuits, physical electronics, optics, lasers, atomic spectroscopy, solid state, nuclear and particle physics.

237-238. INTRODUCTORY ANALYTICAL PHYSICS III AND IV

Throughout the year. Credit four hours a term. An Honors section of 233-234 and 235-236. Prerequisites, same as for 233-234 and 235-236, and in addition (a) a request for this course as expressed by the student in consultation with the 237 instructor and, for an engineering student, with the concurrence of the director of the Division of Basic Studies in the College of Engineering, and (b) an invitation from the instructor. Enrollment limited. Course 237, or consent of the instructor, is prerequisite to 238. T Th S 9:05 or 11:15 and one laboratory every week, M T W or Th 2-4:25. Mr. Berkelman and staff.

Topics include those (none omitted) in Physics 233-234 but their treatment is generally more analytical and somewhat more intensive. At the level of *Electricity and Magnetism*, 1966, by Purcell (Berkeley Physics Course, Vol. 2), of *Spacetime Physics*, 1966, by Taylor and Wheeler, and of *Fundamentals of Optics and Modern Physics*, 1968, by Young.

303. INTERMEDIATE MECHANICS

Fall term. Credit three hours. Prerequisites, Physics 208 (or 102 with special permission), and at least coregistration in Mathematics 213 or 221, or consent of the instructor. T Th S 9:05. Mr. DeWire.

Newtonian mechanics, conservation laws, central forces, oscillation systems, wave propagation, and relativity. At a level slightly higher than *Mechanics*, 1965, by Kittel, Knight, and Ruderman.

#305. THE TWENTIETH-CENTURY REVOLUTION IN PHYSICS

Fall term. Credit four hours. Prerequisites, Physics 208 (preferably 208H), and coregistration in Mathematics 221 or 293, or consent of the instructor. M W F 11:15 and M or T 2:30. Mr. Edwards.

Developments leading to modern physical concepts such as quantum theory of radiation, quantum mechanics, and atomic structure. At a level between the levels of *Elementary Modern Physics*, 1960, by Weidner and Sells, and of *Lectures on Physics*, Vol. III, 1965, by Feynman.

307. OPTICS AND WAVE MOTION

Fall term. Credit four hours. Prerequisites, Physics 208H or 303, and Mathematics 213, or consent of the instructor. Lectures, T Th S 12:20 and T 2:30. Mr. Mahr.

Properties of waves (electromagnetic, mechanical, acoustic, etc.), velocity of light, polarization, interference phenomena, Huygens' and Fermat's principles, Fraunhofer and Fresnel diffraction with application to image formation, double refraction, optical activity, and selected topics of current interest (e.g., coherence phenomena, lasers, holography, etc.). At the level of *Fundamentals of Physical Optics*, third edition, by Jenkins and White, or of *Wave Phenomena* by Towne.

#310. INTERMEDIATE EXPERIMENTAL PHYSICS

Either term. Credit four hours. Prerequisites, Physics 102 or 208, and Mathematics 112 or 192, or consent of the instructor. Lecture, F 2:30-4:25. Laboratory M W 1:25-4:25. An additional laboratory section will be opened in the spring term T Th 1:25-4:25 if registration exceeds thirty-six students. Fall term, Mr. Maxfield and staff; spring term, Messrs. Pohl, Mahr, and staff.

Lectures on topics in experimental techniques. Selected laboratory experiments to suit the student's interests, on such subjects as resonance phenomena, electricity, magnetism, optics, spectroscopy, and modern physics.

311-312. TEACHING HIGH SCHOOL PHYSICS

Throughout the year. Credit one or two hours a term. Prerequisites, two years of college physics and an interest in the teaching of science at an introductory level. Offered only if enrollment exceeds ten students. Course 311 is not prerequisite to 312. T 1:25-4:25. Mr. Parratt.

Seminars and laboratory work. Emphasis is on the nature and design of recent precollege programs in physics and in physical science. Underlying concepts and purposes are stressed, and current trends evaluated. Laboratory work provides experience with recently developed instructional materials, and opportunity for new developments by the students.

#319. ANALYTICAL MECHANICS

Fall term. Credit four hours. Prerequisites, Physics 208H (or 208 with special permission) or 234, and coregistration in Mathematics 421, or consent of the instructor. T Th S 9:05 and F 1:25. Mr. Silsbee.

Analytical mechanics of material particles, systems of particles and rigid bodies; oscillating systems; planetary motion, stability of orbits; collisions; Euler's equations, gyroscopic motion; Lagrange's equations; Hamilton's equation; relativistic mechanics. At the level of *Mechanics*, second edition, by Symon.

322. PRINCIPLES OF ELECTRICITY

Spring term. Credit four hours. Prerequisites, Physics 303 (and preferably 307 and 310), and Mathematics 221 or 331 or 315, or consent of the instructor. M W F 11:15 and Th 12:20 or F 3:35. Mr. Cotts.

Topics selected from Physics 325-326 (excluding optics), treated with less mathematical sophistication. At the level of *Electricity and Magnetism* by Duckworth, or of *Electricity and Magnetism*, 1966, by Purcell (Berkeley Physics Course, Vol. 2).

#325-326. ELECTRICITY, MAGNETISM, AND PHYSICAL OPTICS

Throughout the year. Credit four hours a term. Prerequisites, same as for Physics 319. Course 325 is prerequisite to 326. Lectures, T Th S 11:15 and Th

1:25. Preliminary examinations will be held at 7:30 P.M. on Oct. 15, Nov. 19, Mar. 11, and April 15. Fall term, Mr. Pohl; spring term, Mr. Carruthers.

Electrostatics: Laplace and Poisson equations, boundary value problems, dielectrics. Magnetostatics: magnetic media, boundary conditions, mechanical and field energy. Electrodynamics: wave equation, Maxwell's equations and their applications, transmission lines, wave guides, radiation from a moving charge. Physical optics: reflection, refraction, dispersion, polarization, Fresnel and Fraunhofer diffraction, lasers and masers. Special relativity. At the level of *Lectures on Physics*, Vol. II, by Feynman, of *Foundations of Electromagnetic Theory* by Reitz and Milford, of *Electricity and Magnetism* by Slater and Frank, and of *Optics* by Sommerfeld.

#342. KINETIC THEORY AND THERMODYNAMICS

Spring term. Credit four hours. Prerequisites, Physics 322 (or 305 with special permission), and Mathematics 221 or 331 or 315, or consent of the instructor. T Th S 9:05 and M or T 2:30. Mr. Reppy.

Concepts of temperature, laws of thermodynamics, Carnot cycles, entropy, thermodynamic relations, free energies, phase equilibrium, multicomponent systems, chemical reactions, and thermodynamic stability criteria. Application of thermodynamics to physical systems including gases, paramagnetic solids, and electromagnetic radiation. Normal and Poisson distributions, and the random walk problem. Introduction to statistical mechanics including a treatment of Maxwell-Boltzmann, Bose-Einstein, and Fermi-Dirac statistics with applications. Elementary transport theory. At the level of *Fundamentals of Statistical and Thermal Physics* by Reif, or of *Thermal Physics* by Morse.

355-356. INTERMEDIATE ELECTRODYNAMICS

Throughout the year. Credit three hours each term. Prerequisites, Physics 234 and 236, and coregistration in Mathematics 421, or consent of the instructor. Course 355 is prerequisite to 356. Primarily for students of engineering. Lectures, M W F 10:10. Fall term, Mr. Siegel; spring term, Mr. Kuckes.

Vector calculus. Electrostatic fields, Laplace and Poisson equations and boundary value problems, dielectrics, magnetostatic fields, permeable media. Maxwell's equations and wave equations. Waves in free space and in media. Application of Maxwell's equations to wave guides, plasmas, and magneto-hydrodynamics. Special relativity. Application of the wave equation to radiation: antennas, scattering of light, reflection, diffraction, polarization, and dispersion. At the level of (for first term) *Foundations of Electromagnetic Theory* by Reitz and Milford, *Introduction to Electromagnetic Theory* by Owen, and (for the second term) *Classical Electromagnetic Radiation* by Marion.

#360. INTRODUCTORY ELECTRONICS

Either term. Credit three hours. Prerequisite, Physics 208 or 236, or consent of the instructor. Lectures and laboratory, M W F or T Th F 1:25-4:25. Messrs. Cotts and Peoples.

Introduction to the principles of semiconductor devices, of electronic components and circuits, and to the operating characteristics of power supplies, amplifiers, oscillators, switching and timing circuits, etc. At the level of *Basic Electronics for Scientists*, 1967, by Brophy, and of *Elementary Electronics*, 1966, by White.

#410. ADVANCED EXPERIMENTAL PHYSICS

Either term. Credit four hours. Prerequisites, Physics 310 or 360, and 303 or 319, and 322 or 325 or 355, or consent of the instructor. Limited to seniors

except by special permission. Laboratory, T W or Th F 1:25-4:25. Lecture, M 2:30-4:25. Fall term, Messrs. Hartman, Cuykendall, Hartill, Littauer, Mistry, Rhodin, Stein, Webb and staff; spring term, Messrs. Hartman, Batterman, Cassel, Cuykendall, Loh, Imlay, Mistry, Siegel and staff.

Lectures and problems on selected topics in experimental concepts and techniques. About seventy different experiments are available among the subjects of mechanics, acoustics, optics, spectroscopy, electrical circuits, electronics and ionics, heat, x rays, crystal structure, solid state physics, cosmic rays, and nuclear physics. The student is expected to perform four to eight experiments, selected to meet his individual needs. Stress is laid on independent work.

431-432. INTRODUCTORY THEORETICAL PHYSICS I AND II

Throughout the year. Credit four hours a term. Prerequisites, (a) completion of an undergraduate major program in a physical or biological science, or in engineering, including, for Course 431, the equivalent of Physics 207-208 and, for Course 432, either 431 or the equivalent of Physics 303 and 322, and (b) coregistration in Mathematics 421-422, or consent of the instructor. Primarily for graduate students in a science other than physics (e.g., in chemistry, engineering, or biology) who wish a shortcut to more advanced courses (e.g., to Physics 443, 561, 562 or 572). Fall term, M W F S 10:10; spring term, M W F S 11:15. Fall term, Mr. White; spring term, Mr. Silsbee.

During the fall term emphasis is on particle mechanics and potential theory. Topics include Newtonian mechanics, Lagrange's equations, Hamilton's equations, central forces, rigid body motion, electrostatics, boundary value problems, and Maxwell's equations. At the level of *Mechanics*, second edition, by Symon, and of *Foundations of Electromagnetic Theory* by Reitz and Milford.

During the spring term emphasis is on waves and radiation. Topics include normal modes, waves in mechanical media, electromagnetic waves, normal modes of the electromagnetic field, reflection, refraction, interference, diffraction, dispersion, wave guides, and radiation from an accelerated charge. At the level of *Classical Electromagnetic Radiation* by Marion.

436. MODERN PHYSICS

Spring term. Credit four hours. Prerequisites, Physics 322 or 431, or consent of the instructor. T Th S 11:15 and Th 2:30. Mr. Browman.

Fundamentals of quantum theory, and selected topics in atomic, solid state, particle and nuclear physics. At the level of *Fundamentals of Modern Physics* by Eisberg.

#443. ATOMICS AND INTRODUCTORY QUANTUM MECHANICS

Fall term. Credit four hours. Prerequisites, Physics 305, 319, and 325, or 432, and Mathematics 316 or 421, or consent of the instructor. Very few students should take Physics 572 before taking this course or its equivalent. T Th S 10:10 and M 9:05 or 2:30. Messrs. Bowers and Joseph.

Difficulties with the classical interpretations of atomic properties are resolved in terms of quantum mechanics. At the level of *Introduction to Quantum Theory* by Park.

#444. NUCLEAR AND HIGH-ENERGY PARTICLE PHYSICS

Spring term. Credit four hours. Prerequisite, Physics 443 or consent of the instructor. M W F 9:05 and F 1:25. Mr. Orear.

Behavior of high-energy particles and radiation; elementary particles; basic properties of nuclei; nuclear reactions; nuclear forces; cosmic rays; general

symmetries and conservation laws of nature. At the level of *Nuclei and Particles* by Segre.

#454. INTRODUCTORY SOLID STATE PHYSICS

Spring term. Credit four hours. Prerequisite, Physics 443, or Chemistry 593, or consent of the instructor. T Th S 10:10 and Th 2:30 or 3:35. Mr. Mermin.

A semiquantitative introduction to modern solid state physics, including lattice structure, lattice vibrations, thermal properties, electron theory of metals and semiconductors, magnetic properties, and superconductivity. At the level of *Introduction to Solid State Physics*, third edition, by Kittel.

490. INDEPENDENT STUDY IN PHYSICS

Either term. Credit one to three hours a term. Prerequisites, permission of the professorial staff member under whose direction the work is to be done *must be obtained before registration*. Ordinarily limited to seniors. Hours to be arranged.

Individual project work. Reading or laboratory work in any branch of physics. Commonly associated with the Physics 410 laboratory.

491-492. SENIOR SEMINAR

Throughout the year. Credit one hour each term. Prerequisite, consent of the student's major adviser (or of the instructor if the student is not majoring in physics). Offered only if registration exceeds six students. Course 491 is not prerequisite to 492. Intended primarily for physics majors, either Option A or Option B, in their senior year. F 2:30-4:25. Fall term, Mr. Edwards; spring term, Mr. DeWire.

Practice in the organization, oral presentation, and discussion of selected topics in physics.

For complete descriptions of graduate courses (except Physics 561-562 and 572 which are often taken by advanced seniors) see the *Announcement of the Graduate School: Physical Sciences*.

500. INFORMAL GRADUATE LABORATORY

505-506. DESIGN OF ELECTRONIC CIRCUITRY

510. ADVANCED EXPERIMENTAL PHYSICS

520. PROJECTS IN EXPERIMENTAL PHYSICS

561-562. THEORETICAL PHYSICS I AND II

Throughout the year. Credit four hours each term. Prerequisites, Physics 319 and 325, or 432, and coregistration in Mathematics 415 or 423, or consent of the instructor. Course 561 and either 443 or coregistration in 572 are prerequisite to 562. M 1:25 and T Th S 11:15. Fall term, Mr. Gross; spring term, Mr. Nelkin.

Fall term. Mechanics (about 7 weeks): variational principles, Lagrangian mechanics with applications, Hamiltonian mechanics and Poisson brackets, small vibrations and normal modes, and symmetry principles. Electrodynamics (about 8 weeks): Maxwell's equations, electromagnetic potentials, stress energy, wave guides, Fresnel theory, and relativity. At the level of *Mechanics* by Landau and Lifshitz, and of *Electricity and Magnetism* by Jackson.

Spring term. Electrodynamics (about 6 weeks): radiation, Lienard-Wiechert potentials, multipoles, relativity (continued), and relativistic applications. Statistical physics (about 9 weeks): laws of thermodynamics, introduction to

phase change, ensemble theory, thermodynamic fluctuations, Fermi-Dirac and Einstein-Bose statistics with applications, transport phenomena, and interacting systems. At the level of *Electricity and Magnetism* by Jackson, and of *Statistical Physics* by Landau and Lifshitz.

572. QUANTUM MECHANICS

Either term. Credit four hours. Prerequisites, Physics 443, 561 (or 432 with special permission), and at least coregistration in Mathematics 415 or 423, or consent of the instructor. M W F 11:15 and S 9:05. Fall term, Mr. Krumhansl; spring term, Mr. Gottfried.

Principles of wave mechanics. Illustrative solutions of the Schrödinger equation, scattering, Dirac's formulation of quantum mechanics, transformation theory, and approximation methods. Symmetries: angular momentum, spin, the exclusion principle. At the level of *Quantum Mechanics*, Vol. I and part of Vol. II, by Messiah.

574. INTERMEDIATE QUANTUM MECHANICS

612. EXPERIMENTAL ATOMIC AND SOLID-STATE PHYSICS

614. EXPERIMENTAL HIGH-ENERGY PHYSICS

635. SOLID STATE PHYSICS I

636. SOLID STATE PHYSICS II

645. NUCLEAR PHYSICS

646. HIGH ENERGY PARTICLE PHYSICS

Note: In courses above 650 the final grades will be only S or U.

651. ADVANCED QUANTUM MECHANICS

652. QUANTUM FIELD THEORY

653. STATISTICAL PHYSICS

654. THEORY OF MANY-PARTICLE SYSTEMS

[657. THEORY OF NUCLEI]

Not offered in 1969-70.

661. HIGH ENERGY PHENOMENA

665. TOPICS IN THEORETICAL ASTROPHYSICS

680(A,B,C,D). SPECIAL TOPICS

The particular topics will be announced just before the start of each term.

690. INDEPENDENT STUDY IN PHYSICS

PSYCHOLOGY

Mr. H. Levin, Chairman; Messrs. H. Alker, A. L. Baldwin, H. Bernbach, U. Bronfenbrenner, R. D. Darlington, W. C. Dilger, N. Garnezy, Mrs. Eleanor J. Gibson, Messrs. J. J. Gibson, B. P. Halpern, S. C. Jones, W. W. Lambert, E. H. Lenneberg, J. B. Maas, R. B. MacLeod, L.

Meltzer, U. Neisser, D. T. Regan, F. Rosenblatt, T. A. Ryan, M. E. Seligman, R. Shaw, F. Stollnitz, and G. W. Wilcox.

THE MAJOR. Prerequisites for admission are: (a) three courses in psychology which must include Psychology 101 and will normally include a laboratory course (Child Development 115 may be counted toward the three course requirement); (b) no grade below C+ in any psychology course; (c) acceptance by the admissions committee of the Department of Psychology.

Application forms may be obtained at the departmental office and should be filed two weeks before the preregistration period.

Requirements for the major are:

(a) A total of forty hours in psychology, including prerequisites, at least twenty hours of which are in courses numbered 300 or higher. Students majoring in psychology are expected to choose, in consultation with their advisers, a range of courses which cover the basic processes in psychology, and to have laboratory experience.

(b) Completion, by the beginning of the senior year, of an approved course in statistics, or the passing of an achievement examination administered by the department.

With the permission of the major adviser, courses in other departments may be accepted toward the major requirements.

CONCENTRATION IN SOCIAL PSYCHOLOGY. In cooperation with the Department of Sociology, a concentration in social psychology is available. Psychology majors who wish to specialize in social psychology are expected to meet the general requirements set by the Department, including statistics and laboratory. To ensure a solid interdisciplinary grounding, students in the concentration will be permitted to include in the major courses in sociology and related fields. Advisers will assist the student in the selection of a coherent set of courses in social organization, cultural anthropology, experimental psychology, social methodology, and several aspects of social psychology. Seniors in the concentration may elect graduate seminars.

THE HONORS PROGRAM is intended to give the student an opportunity to examine selected problems in depth, and subsequently to carry out independent investigation under the direction of a faculty member. During the spring term of their junior year, Honors students will take either Psychology 494, a special seminar focusing on classic problems in psychology, or (with their adviser's consent) some other appropriate course at the 400 level or above. In the fall term of their senior year, they will enroll in Psychology 495, choosing between a special seminar dealing with problems in perception, learning, and physiological psychology and one dealing with problems in personality and social psychology. These seminars are intended to help the student focus on a thesis problem, and will consist primarily of individualized instruction. Thesis research will normally begin during this semester, and will continue in the spring, by enrollment in Psychology 498. Final Honors standing is based upon a written thesis (due on the first Monday in May) and an oral defense of the thesis, as well as upon general academic

performance. Prospective candidates are encouraged to file applications as early as possible but not later than the Friday before Thanksgiving. These applications should be turned in to one of the department secretaries in Room 313, Morrill Hall. For consideration by the Honors Committee applicants must have, at a minimum, a cumulative grade average of B in all courses taken in psychology.

THE DISTRIBUTION REQUIREMENT in social sciences is satisfied by any two courses in psychology. (Child Development 115 may be counted.)

PARTICIPATION IN EXPERIMENTS. Participation in psychological experiments may be required as a part of course work for any student when the instructor considers that it will be to the student's educational advantage.

101. INTRODUCTION TO PSYCHOLOGY: BASES OF HUMAN BEHAVIOR

Fall term. Credit three hours. Open to freshmen. Those planning to major in psychology should begin with this course. Three lectures and one demonstration-discussion seminar per week. Lectures, M W F 10:10; seminars to be assigned. Mr. Maas.

Emphasizes the study of human behavior from the standpoint of the basic processes. Topics include brain functioning, dreaming, intelligence, psychological testing, perception, learning, motivation, emotion, abnormal behavior, and psychiatry. The course centers upon contemporary problems confronting psychologists and is supported by films, guest speakers, and discussion seminars. As part of an active educational experience, some participation in psychological experiments is required.

INTRODUCTION TO PSYCHOLOGY: DEVELOPMENT OF HUMAN BEHAVIOR (Child Development 115)

Fall term. Credit three hours. Open to freshmen. Psychology 101 not prerequisite. Three lectures and an optional section meeting. Lectures, M W F 11:15, sections to be announced. Mr. Bronfenbrenner.

Concerned with the behavior of man as a social organism. Primary attention is given to the impact of environmental and social forces in the intellectual, emotional, and social development of the person from infancy through adulthood.

102. INTRODUCTION TO PSYCHOLOGY: PERSONALITY AND SOCIAL BEHAVIOR

Spring term. Credit three hours. Open to freshmen. No prerequisites. M W F 11:15. Mr. Jones.

An examination of personality and social influences on the individual's adjustment to himself and his environment. Both classic and contemporary viewpoints will be considered and evaluated in the light of empirical evidence.

[103. EDUCATIONAL PSYCHOLOGY]

Spring term. Credit three hours. Prerequisite, an introductory course in psychology. Not offered in 1969-70.

201. INTRODUCTION TO EXPERIMENTAL PSYCHOLOGY

Fall term. Credit four hours. *No prerequisites.* Lectures, M W F 10:10. Laboratory, to be arranged. Mr. Seligman.

An analysis of current and classical research problems selected for their relevance to general theoretical issues and illustrative of modern research in psychology. Specific topics will be chosen from the fields of learning, motivation, perception, and the like. Provides an introduction to laboratory methods and experimental design useful in many of the advanced courses in psychology.

206. PSYCHOLOGY IN BUSINESS AND INDUSTRY

Spring term. Credit three hours. Prerequisite, Psychology 101 or Child Development 115, or consent of the instructor. M W F 1:25. Mr. Schapiro.

A survey of psychological research in problems of concern to business and industry. The course is divided into three units: (1) personnel selection and placement (interviewing, psychological testing); (2) conditions of efficient production (work methods, accident control, training, counseling, group dynamics, job satisfaction); and (3) advertising, market and motivation research.

210. ATTENTION AND MEMORY

Spring term. Credit three hours. Prerequisite, Psychology 101 or consent of the instructor. M W F 12:20. Mr. Neisser.

A study of the relations between the constructive processes of attention and memory, emphasizing recent studies of attentive and preattentive processes in vision, of selective listening, of short-term memory and recoding, and of long-term memory and imagery.

212. MODERN PSYCHOLOGY IN HISTORICAL PERSPECTIVE

Spring term. Credit four hours. Prerequisite, one course in psychology or consent of the instructor. Lectures, M W F 1:25. Mr. MacLeod.

An examination of the broad problems of psychology, e.g., mind and body, the basis of knowledge, the basis of conduct, as they have been envisaged at various periods of history. Special emphasis is laid on the relation between psychological thinking and developments in philosophy, religion, the sciences, literature, and the arts. Designed for the general student.

215. LINGUISTICS AND PSYCHOLOGY

Fall term. Credit three hours. Open to freshmen. Prerequisite, consent of the instructor. M W F 11:15. Messrs. Kelley and Shaw.

An introductory course covering the recent development of a new field of study based on psychology and linguistics. Topics covered will be the nature of language and its acquisition, the influence of the sounds and grammar of language on perception and memory, bilingualism, and dialects.

216. DECISION AND CHOICE

Spring term. Credit three hours. Prerequisite, a course in psychology or consent of the instructor. M W F 2:30. Mr. Wilcox.

A study of attempts to account for human risky and riskless choice behavior. Topics will include the experimental determination of utility and subjective probability, theories about strength of preference, portfolio theory and a discussion of freedom in decision making.

INTERGROUP RELATIONS: PREJUDICE, DISCRIMINATION AND CONFLICT

(Sociology 264)

Spring term. Credit three hours. Prerequisite, Sociology 101 or consent of the instructor. T Th S 11:15. Mr. Williams.

281. INTERPERSONAL RELATIONS AND SMALL GROUPS

(Also Sociology 281)

Fall term. Credit three hours. Prerequisite, Sociology 101, Psychology 102 or Child Development 115. M W F 11:15.

The presentation and development of selected theories offered to account for the dynamics of interpersonal relationships and the social structures which emerge from, and condition, these relationships. Emphasis will be upon social psychological processes in small groups, such as athletic teams, committees, fraternities, and engaged couples. These perspectives are compared and evaluated.

284. SOCIAL-PSYCHOLOGICAL APPROACHES TO SOCIAL PROBLEMS

(Also Sociology 284)

Spring term. Credit four hours. Prerequisite, a course in psychology or sociology. T Th 10:10 and one hour discussion section to be arranged. Mr. Meltzer.

Students will read extensively in modern and classic attempts to explicate social and personal problems. The approaches of several theories—psychoanalytic, cognitive, behavioral, and role—will be considered in relation to topics such as personal rigidity, stigmata, conformity, prejudice, hysterical contagion, deviance, mental illness, conflict, intergroup relations, and social engineering. Lectures will evaluate these perspectives in terms of recent research.

301. AN INFORMATION PROCESSING APPROACH TO PSYCHOLOGY

Fall term. Credit three hours. Prerequisite, one year of mathematics or a physical science, or consent of the instructor. M W F 10:10. Mr. Bernbach.

Introductory treatment of human behavior as the behavior of an information processing system. Topics covered include input and coding of information (detection and perception), storage and retrieval of information (learning and memory), and output processes (skill learning and performance). Also covered is a treatment of behavior as a choice among alternatives and the bases of such choices (motivation).

305. PERCEPTION

Fall term. Credit four hours. Prerequisite, two courses in psychology including Psychology 101. Lectures, M W 9:05; Laboratory, W or Th 2:30-4:25. Mr. Shaw.

The basic phenomena of visual and auditory perception studied in terms of the stimulus variables on which they depend and of the mechanisms involved. Topics include the detection of weak stimuli, perceptual constancy and illusion, visual and auditory space perception, motion, and perceptual adaptation.

306. LEARNING

Spring term. Credit four hours. Prerequisite, Psychology 101, 201, or 301, or consent of the instructor. Lectures. T Th 9:05; Laboratory, T or W 2:30-4:25. Mr. Stollnitz.

The fundamental conditions and principles of learning, both animal and

human. The basic phenomena of operant conditioning, human verbal and motor learning, discrimination learning, and serial learning will be studied experimentally. Traditional and contemporary theories of learning will be reviewed, and selected experimental literature will be discussed with special emphasis upon recent developments in the field.

307. MOTIVATION

Fall term. Credit four hours. Prerequisites, Psychology 101 and 201, or 306, or consent of the instructor. Lectures, W F 10:10; Laboratory, T 2:30-4:25.

Factors controlling the initiation, direction, and intensity of activity. Methods of research with emphasis upon experimental and statistical controls. Evaluation of evidence on major theories of motivation such as instinct theory, psychoanalysis, and behavioristic drive theory.

309. DEVELOPMENT OF PERCEPTION AND ATTENTION

Spring term. Credit four hours. Prerequisite, Psychology 305 or consent of the instructor. M W F 10:10. Mrs. Gibson.

Selection and processing of stimulus information—objects, space, events, and coded stimuli—in evolution and in individual development; theories of perceptual learning.

313. COGNITIVE PROCESSES

Fall term. Credit four hours. Prerequisite, six hours of psychology or consent of the instructor. M W F 11:15. Sections to be arranged.

An examination of the mental processes involved in language learning and use, concept formation, and problem solving; relation between language and thinking. Students are required to carry out a supervised experimental or observational study.

NEUROBIOLOGY AND BEHAVIOR

(Biological Sciences 320)

Spring term. Credit three hours. Prerequisites, Biological Sciences 101-102 or 103-104, and upper class standing. T Th S 11:15. Messrs. Camhi, Eisner, Emlen, Gilbert, Halpern, Howland, O'Brien, Rosenblatt, and Mrs. Salpeter.

BRAIN MECHANISMS AND MODELS

(Biological Sciences 521-522)

Throughout the year. Credit four hours a term. Prerequisites, one year of calculus and one year of biological sciences or psychology, and consent of the instructor. Mr. Rosenblatt with assistance of guest lecturers.

323. PHYSIOLOGICAL PSYCHOLOGY

Fall term. Credit four hours. Prerequisites, Psychology 101 or the equivalent, Psychology 201 or a 300-level laboratory course in Psychology, Biological Sciences 101-102 or its equivalent, and Chemistry 103-104 or its equivalent. T Th 9:05 and Laboratory, T 1:25-5:30. Mr. Halpern.

A selective examination of neuroendocrine and neurophysiological functions related to emotion, learning, eating, and perception.

325. ABNORMAL PSYCHOLOGY

Fall term. Credit four hours. Prerequisite, nine hours of psychology, or consent of the instructor. M W 3:35-4:50. Mr. Garnezy.

An introduction to the study of disordered behavior. Description of major syndromes, investigations and theories of etiology, and approaches to treat-

ment will be covered in an attempt to introduce the student to major concepts and problems in this area.

327. BEHAVIORAL MATURATION

(Also Biological Sciences 327)

Fall term. Credit four hours. Prerequisites, familiarity with psychological theories of learning and development and one year of college biology. M W F 10:10. Mr. Lenneberg.

Emergence of behavior will be studied in the light of developmental biology, including behavior genetics, neuroembryology and morphogenesis, physical maturation of the brain, transformation and allometry as well as retarding influences from the environment.

350. STATISTICS AND RESEARCH DESIGN

Spring term. Credit four hours. Prerequisite, a course in the behavioral sciences. M W F 11:15. Mr. Darlington.

Devoted about equally to elementary applied statistics—both estimation and hypothesis testing—through two-way analysis of variance, and to general problems in the design and analysis of research projects.

381. SOCIAL PSYCHOLOGY

(Also Sociology 381)

Either term. Credit four hours. Prerequisites, three hours of psychology and three hours of sociology. M W F 10:10. Fall term, instructor to be appointed; spring term, Mr. Lambert.

Analysis of the history, concepts, methods, and theories used to describe and conceptualize the ways in which people react to one another in social settings and in the laboratory. Students will work individually or as teams on projects, using experimental or other empirical methods. The topics for investigation in lectures and reading will include socialization, attitude change, communication, interpersonal influence, impression formation, leadership, and propaganda.

385. THEORIES OF PERSONALITY

(Also Sociology 385)

Fall term. Credit four hours. Prerequisite, Psychology 101 or 102, or consent of the instructor. M W F 12:20. Mr. Lambert.

A critical survey of the concept of personality in literature, the social sciences, and psychology. A number of the modern specialists will be discussed at some length, and recent empirical and experimental work that has grown out of their thought will be analyzed. The empirical relation of personality notions to some philosophical beliefs and literary productions will be considered. The emphasis will be mainly upon "normal" personality.

387. PSYCHOLOGICAL ASPECTS OF POLITICAL BEHAVIOR

(Also Sociology 387)

Fall term. Credit four hours. Prerequisites, junior standing and a course in social psychology, or consent of the instructor. M W F 9:05. Mr. Alker.

A survey covering the authoritarian personality, political paranoia, affective determinants of "left" and "right" ideology, characteristics of active political participants, Machiavellianism, stress and political decision making, need for power, and political attitude change. An empirical, hypothesis-testing approach will be adopted.

Primarily for Seniors and Graduate Students

401. PSYCHOLOGICAL TESTING I

Fall term. Credit four hours. Prerequisites, six hours in psychology and a course in elementary statistics. T Th 11:15, additional hours to be arranged. Mr. Darlington.

Emphasis is on the logical and mathematical problems in the interpretation, evaluation, and construction of tests. No training in administering tests.

402. PSYCHOLOGICAL TESTING II

Spring term. Credit four hours. Prerequisite, Psychology 401 or consent of the instructor. T Th 11:15, additional hours to be arranged. Mr. Darlington.

A more advanced treatment of the topics discussed in Psychology 401.

410. INDIVIDUAL DIFFERENCES AND PERSONALITY

Spring term. Credit four hours. Prerequisites, seven hours of psychology and junior or senior standing, or consent of the instructor. M W F 10:10. Mr. Alker.

Survey of theory and research concerning individual differences in personality, intelligence, creativity, anxiety, learning, perception, motivation, attitudes, and attitude change. Emphasis will be given to the applicability of different research techniques.

[412. RESEARCH DESIGN IN PERSONALITY AND SOCIAL PSYCHOLOGY]

Spring term. Credit four hours. Open to junior or senior psychology majors or consent of the instructor. Not offered in 1969-70.

416. PSYCHOLOGY OF LANGUAGE

Spring term. Credit four hours. Prerequisite, Psychology 313 or consent of the instructor. M W 2:30-4.

An advanced treatment of the nature of the human capacity for language, the reading process, social and psychological aspects of bilingualism, speech perception and production. Instruction will be supplemented by experimental exercises.

424. BRAIN AND BEHAVIOR

(Also Biological Sciences 424)

Spring term. Credit four hours. Prerequisites, familiarity with theories of perception, memory, and physiological psychology, or permission of the instructor. Hours to be arranged. Mr. Lenneberg.

A theoretical introduction to human neurology for psychologists. This survey of clinical symptoms and their etiology is designed to enable students to make use of disease for research purposes.

426. EXPERIMENTAL PSYCHOPATHOLOGY

Spring term. Credit four hours. Prerequisite, consent of instructor. Lecture, M W 3:35-4:50. Mr. Garmez.

The application of experimental methods to behavior disorders. A survey of current investigations of etiology and treatment with special emphasis upon a scientific approach to pathology.

427. SENSORY FUNCTION

(Also Biological Sciences 427; also Physical Biology 427)

Fall term. Credit three hours. Prerequisite, Biological Sciences 320 or equiva-

lent and permission of the instructors. T Th 11:15 and a one-hour discussion section to be arranged. Messrs. Halpern and Tapper.

Sensory receptors and the central nervous system transformation of afferent activity will be considered in relation to human and animal psychophysical data and to the adaptive significance of behavior. The receptor will be examined in terms of anatomy, biochemistry, biophysics of transduction and the central nervous-system control of peripheral input. Offered in alternate years.

427A. SENSORY FUNCTION LABORATORY

(Also Biological Sciences 427A)

Fall term. Credit two hours. Prerequisite, Psychology 427 and permission of the instructors. Enrollment limited to fifteen students. Hours to be arranged. Messrs. Halpern and Tapper.

Experiments on the principles of receptor function and afferent neural activity. Offered in alternate years.

COMPARATIVE VERTEBRATE ETHOLOGY

(Biological Sciences 421)

Fall term. Credit three hours. Primarily for graduate students; juniors and seniors will be accepted to capacity of laboratory. Prerequisites, Biological Sciences 101-102, or 103-104, and 320, and permission of the instructor. T Th 9:05 and laboratory to be arranged. Mr. Dilger.

[429. PSYCHOPHYSICS AND SCALING]

Spring term. Credit four hours. Prerequisites, one year of calculus, a course in experimental psychology, and junior or senior standing, or consent of the instructor. Offered in alternate years. Mr. Wilcox. Not offered in 1969-70.

461. HUMAN LEARNING AND MEMORY

Spring term. Credit four hours. Prerequisite, Psychology 101, 201, or 301, or the equivalent. M W F 10:10. Mr. Bernbach.

Basic processes of human learning and memory, particularly for simple verbal material. Emphasis on the storage and retrieval of information as the fundamental unit of learning.

462. DISCRIMINATION LEARNING

Fall term. Credit four hours. Prerequisite, Psychology 306 or the equivalent. Hours to be arranged. Mr. Stollnitz.

Theories of discrimination learning will be examined in the light of data. Discrimination performance of human and nonhuman subjects in acquisition, reversal, transfer, and learning-set experiments will be included. Laboratory work will emphasize individual projects.

465. MATHEMATICAL BEHAVIOR THEORY

Fall term. Credit four hours. Prerequisite, one year of calculus. M W F 2:30. Mr. Wilcox.

The purpose of this course is to give a brief overview of current developments in mathematical psychology and to develop techniques for the application of mathematics to psychological theory. Topics covered include choice behavior, decision theory, psychophysics, memory and learning theory, and information processing models of behavior.

466. THEORIES OF VISION

Spring term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. Gibson.

471-472. STATISTICAL METHODS IN PSYCHOLOGY

Throughout the year. Credit four hours each term. Prerequisites, Psychology 101 or Child Development 115, Psychology 201 or consent of the instructor. Psychology 471 is prerequisite to 472. M W F 1:25. Mr. Ryan.

An analysis of the methods for treating various kinds of psychological data. Fall term: tests of significance and confidence limits, analysis of variance and correlation. Spring term: complex designs in analysis of variance, analysis of trends and covariance, multiple and curvilinear correlation, introduction to factor analysis.

476. INSTRUMENTATION FOR PSYCHOLOGICAL RESEARCH

Fall term. Credit three hours. Enrollment limited to ten students. Prerequisite, consent of the instructor. Lecture and laboratory totalling three hours to be arranged. Messrs. Wilcox, Stollnitz and staff.

Principles and use of basic circuitry, digital logic, amplifiers and transducers, mechanical and optical devices, photography.

480. ATTITUDES AND ATTITUDE CHANGE

(Also Sociology 480)

Spring term. Credit four hours. Prerequisites, three hours of psychology and three hours of sociology. M W F 11:15. Mr. Regan.

A systematic survey of theory and research on attitudes and attitude change.

481. ADVANCED SOCIAL PSYCHOLOGY

(Also Sociology 481)

Fall term. Credit four hours. Prerequisites, a course in social psychology or consent of the instructor. M W F 11:15. Mr. Regan.

Emphasis is on the empirical study of social psychological phenomena. Students will be introduced to empirical laboratory and field methods used in social psychology. Substantive problems will provide the focus for the demonstration and use of these techniques.

483. SOCIAL INTERACTION

(Also Sociology 483)

Fall term. Credit four hours. Prerequisites, written consent of the instructor and three hours in psychology and three hours in sociology. Hours to be arranged. Mr. Hayes.

A field and laboratory course dealing with the major dimensions of interpersonal perception and behavior. The relation of these dimensions to self-conception, social roles, group structure and dynamics are examined. Contemporary research is stressed in the readings. Student projects are an integral part of the course.

484. EXPERIMENTAL GROUP DYNAMICS

(Also Sociology 484)

Spring term. Credit four hours. Prerequisites, a course in statistics and a course in social or experimental psychology. W 1:25-3:20 and additional laboratory time to be arranged. Mr. Meltzer.

A practicum. Supervised research experience in the design, execution, and analysis of experimental research on topics such as group cohesiveness, group pressures, group goals, leadership, group performance, and interpersonal influence and communication. Students will read and discuss experimental studies as well as pertinent theoretical articles.

486. GROUPS AS SOCIALIZING AGENTS

(Also Sociology 486)

Spring term. Credit four hours. Prerequisites, two courses in psychology or sociology and upperclass or graduate standing. T 1:25-3:20. Mr. Bronfenbrenner.

The course examines critically existing theory and research on the role of groups in shaping the behavior and values of their members. Particular attention is focused on such processes as modeling, social reinforcement, and pressure to conform in enduring social structures such as the family, the peer group, work teams, and business organizations. Students are expected to work independently in assembling and evaluating material relevant to particular issues.

[488. INDIVIDUAL AND SOCIETY IN THE SOVIET UNION]

(Also Sociology 488)

Spring term. Credit four hours. Prerequisite, consent of the instructor. Will be conducted as a seminar. Hours to be arranged. Mr. Bronfenbrenner. Not offered in 1969-70.

489. SEMINAR: SELECTED TOPICS IN SOCIAL PSYCHOLOGY

(Also Sociology 489)

Either term. Credit four hours. Prerequisites, consent of the instructor and three hours of psychology and three hours of social psychology or sociology. Hours to be arranged. Fall term, Mr. Jones; spring term, instructor to be appointed.

A small discussion seminar dealing with issues in both social and personality psychology. Fall term: Initial discussions will focus on specific areas of the field such as interpersonal evaluation, attitude change, and group processes. Subsequently, the discussions will become more general and raise such questions as what are the major themes social psychologists are or should be studying and what are the appropriate units of analysis of social behavior. Spring term: Topic to be announced.

494. JUNIOR HONORS SEMINAR

Spring term. Credit four hours. Prerequisite, admission to the departmental Honors Program. Hours to be arranged.

One or more fundamental issues in psychology will be examined in depth, and from many points of view.

495. SENIOR HONORS SEMINAR

Fall term. Credit four hours. Prerequisite, admission to the departmental Honors Program. Hours to be arranged.

This seminar is intended to introduce the Honors student to specific areas of psychological research so that he can choose and begin working on a dissertation topic. The seminar will usually be divided into two sections, dealing with different areas of interest.

496. SUPERVISED STUDY

Either term. Credit two hours. Staff.

497. SUPERVISED STUDY

Either term. Credit four hours. Staff.

498. SENIOR HONORS DISSERTATION

Spring term. Credit four hours. Prerequisite, admission to the departmental Honors Program and (usually) Psychology 495. Hours to be arranged.

Graduate Courses and Seminars

Primarily for graduate students, but with the consent of the instructor may be taken by qualified undergraduates. Approximately five graduate courses or seminars will be offered each term, the selection to be determined by the needs of the students. During the preregistration period, the list of courses and seminars for the following term will be posted, specifying instructors, topics to be covered, and hours of meeting. Only grades of S or U will be given in the following courses:

501-502. GENERAL SEMINAR FOR BEGINNING GRADUATE STUDENTS

Either term. Credit three hours.

511-512. PERCEPTION

Either term. Credit four hours.

513-514. LEARNING

Either term. Credit four hours.

515-516. MOTIVATION

Either term. Credit four hours.

517-518. LANGUAGE AND THINKING

Either term. Credit four hours.

521-522. PSYCHOBIOLOGY

Either term. Credit four hours.

523-524. PHYSIOLOGICAL PSYCHOLOGY

Either term. Credit four hours.

525-526. MATHEMATICAL PSYCHOLOGY

Either term. Credit four hours.

531-532. HISTORY OF PSYCHOLOGY

Either term. Credit four hours.

541-542. STATISTICAL METHODS

Either term. Credit four hours.

543-544. PSYCHOLOGICAL TESTS

Either term. Credit four hours.

545-546. METHODS OF SOCIAL ANALYSIS IN SOCIAL PSYCHOLOGY

Either term. Credit four hours.

547-548. METHODS OF CHILD STUDY

Either term. Credit four hours.

561-562. HUMAN DEVELOPMENT AND BEHAVIOR

Either term. Credit four hours.

575-576. PERSONALITY

Either term. Credit four hours.

577-578. INDUSTRIAL PSYCHOLOGY

Either term. Credit four hours.

581-582. EXPERIMENTAL PSYCHOLOGY

Either term. Credit four hours.

583-584. PROSEMINAR IN SOCIAL PSYCHOLOGY

(Also Sociology 583-584)

Either term. Credit four hours.

Critical analysis of the major current theories and research in social psychology.

585. SOCIAL STRUCTURE AND PERSONALITY

(Also Sociology 585)

Fall term. Credit four hours. Prerequisite, graduate student standing or consent of the instructor. T 3:35-5:30. Mr. Rosen.

A discussion seminar examining the impact of structural factors on personality development, and on the ways in which individual internal states and behavior patterns affect the functioning of social systems.

591-592. EDUCATIONAL PSYCHOLOGY

Either term. Credit four hours.

595-596. THE TEACHING OF PSYCHOLOGY

Either term. Credit four hours.

681-682. SEMINAR IN SOCIAL PSYCHOLOGY

(Also Sociology 681-682)

Either term. Credit four hours.

Research oriented analysis of selected topics in social psychology.

683. RESEARCH PRACTICUM IN SOCIAL PSYCHOLOGY

(Also Sociology 683)

Fall term. Credit four hours. Hours to be arranged. Mr. Hayes.

The focus will be upon linking social psychological and social organizational analysis.

SEMINAR: SOCIAL PSYCHOLOGY OF MODERNIZATION

(Sociology 685)

Spring term. Credit four hours. Hours to be arranged. Mr. Rosen.

An analysis of the interacting effects of social structure and personality on social change in developing countries.

687-688. SOCIAL PSYCHOLOGY AND PERSONALITY COLLOQUIA

(Also Sociology 687-688)

Either term. Credit two hours. W 4:00-5:30. Mr. Meltzer and visiting staff.

Weekly lectures by visiting and Cornell faculty, sponsored by the Interdepartmental Program in Social Psychology and Personality, are open to the general public. Graduate students may earn credit by regular attendance, reading selective writings by each speaker, and writing an integrative term paper. Each semester the colloquia will concentrate on a new theme.

ROMANCE STUDIES

Mrs. Jean Parrish, Chairman; Messrs. J. Béreaud, J. S. Bernstein, G.-P. Biasin, D. Brenes, Miss Alice Colby, Messrs. H. Dieckmann, D. I. Grossvogel, M. Lazar, J. Kronik, P. Lewis, Mrs. Dorothy McCall, Messrs. E. P. Morris, K.-L. Selig, A. Seznec, and staff.

The Department of Romance Studies offers courses in French language and literature, Italian language and literature, and Spanish language and literature. For complete course listing and for details of the major programs in French, Italian and Spanish, see those language headings under *Modern Foreign Languages and Literatures*.

RUSSIAN LITERATURE

Mr. G. Gibian, Chairman; Miss Patricia Carden, Mr. W. Chalsma, Miss Antonia Glasse, and Mr. M. Horwitz.

For complete course listings and for details of the major, see the heading "Russian" under *Modern Foreign Languages and Literatures*.

SEMITIC LANGUAGES AND LITERATURES

Mr. I. Rabinowitz, Chairman; Messrs. C. M. Carmichael, A. L. Ivry, D. W. Young.

The Department of Semitic Languages and Literatures offers Cornell undergraduates access to the thought and self-expression of the cultures which produced Judaism, Christianity, and Islam, and which today help to define and characterize the many millions of people in the group of countries that comprise the region we call the Middle East. Hebrew, Aramaic, and Arabic are not only the languages of the Old Testament and of the Koran, but of literatures of intrinsic merit and interest whose influence has permeated and enriched the literatures of many other civilizations, both East and West, ancient and modern, including our own. Studies pursued in this Department will, therefore, be found of lasting benefit and utility to all whose career interests involve the Middle East or Africa, and to all whose interest in religion and the humanities is more than merely casual.

Students who elect Semitics as their major study must complete twenty-four hours of advanced courses offered by the Department (courses numbered above 201, except as specified below) and fifteen hours, approved by the Department, in related subjects. Related subjects may be selected by the student from course offerings in other departments of the College which are relevant to his intellectual interests or to his preparation for professional training or graduate study.

Students whose major study is in Semitics may emphasize either Hebrew or Arabic language and texts, provided that at least nine hours of course work be taken in the less emphasized language; all courses in

the less emphasized language may be counted among the twenty-four needed to complete the major study.

Independent study may be arranged for students who have special interests or needs and are able to work in areas not covered by the courses.

THE HONORS PROGRAM. Candidates for the degree of Bachelor of Arts with Honors in Semitics, in addition to fulfilling the requirements of the major study as outlined above, must complete successfully the special Honors courses 370, 371, and 372. Part of the credit for Honors courses may be included in the twenty-four hours required for the major study. Students who wish to become candidates for Honors and who have a cumulative average of B or better should consult their major advisers before preregistering for the second term of the junior year.

THE DISTRIBUTION REQUIREMENT in humanities is satisfied in Semitics literatures by any two courses in Semitics at the 200 level or higher, provided the courses have not been used in fulfilling the language requirement.

Hebrew and Aramaic

101-102. ELEMENTARY LITERARY HEBREW

Throughout the year. Credit three hours a term. First term prerequisite to the second. M W F 12:20. Mr. Rabinowitz.

Introduction to the 2000-year-old post-Biblical literary language of the Jewish people, now again spoken in the State of Israel.

103. CLASSICAL HEBREW FOR ADVANCED STUDENTS

Fall term. Credit three hours. Prerequisite, Hebrew 102 or three units of entrance Hebrew. M W F 11:15. Mr. Carmichael.

Designed to give students systematic control of the grammar and syntax of the Hebrew language and to introduce them to the foundation of all Hebrew literature, the Bible.

201. CLASSICAL HEBREW PROSE

Either term. Credit three hours. Prerequisite, Hebrew 103, or consent of the instructor. M W F 2:30. Mr. Carmichael.

Selected prose narratives of the Hebrew Bible.

204. POST-BIBLICAL HEBREW PROSE (1)

Spring term. Credit three hours. Prerequisites, Hebrew 103, or three units of entrance Hebrew and the consent of the instructor. T Th 9:05 and an additional hour to be arranged. Mr. Ivry.

Rapid reading of narrative texts in rabbinic, medieval, and modern Hebrew.

302. CLASSICAL HEBREW POETRY

Spring term. Credit four hours. Prerequisite, Hebrew 201 or consent of the instructor. Hours to be arranged. Mr. Carmichael.

Reading and interpretation of texts selected from the Psalter and the Prophets.

305. POST-BIBLICAL HEBREW PROSE (2)

Fall term. Credit four hours. Prerequisites, Hebrew 204, or four units of entrance Hebrew and consent of the instructor. Hours to be arranged. Mr. Ivry.

Readings in the Mishnah, in medieval theological and philosophical texts, and in the modern essay.

[307. POST-BIBLICAL HEBREW POETRY]

Fall term. Credit four hours. Prerequisite, Hebrew 305. Not offered in 1969-70.

[411. MISHNAH AND TOSEPHTA]

Fall term. Credit four hours. Prerequisite, Hebrew 305 or consent of the instructor. Not offered in 1969-70.

422. MIDRASH

Spring term. Credit four hours. Prerequisite, Hebrew 305 or consent of the instructor. Hours to be arranged. Mr. Rabinowitz.

Study of a group of texts, illustrative of the methods of *midrash halākhā* and of *midrash haggadah*, and drawn respectively from the classical collections of the Tannaitic and homiletic Midrashim.

[423. TALMUD]

Fall term. Credit four hours. Prerequisite, Hebrew 305 and Aramaic 452, or consent of the instructor. Not offered in 1969-70.

[432. MEDIEVAL HEBREW LITERATURE]

Spring term. Credit four hours. Prerequisite, Hebrew 305 or consent of the instructor. Not offered in 1969-70.

[441. MODERN HEBREW LITERATURE]

Fall term. Credit four hours. Prerequisite, Hebrew 305 or consent of the instructor. Not offered in 1969-70.

[451. ARAMAIC]

Fall term. Credit four hours. Prerequisite, Hebrew 201, Arabic 208, or consent of the instructor. Not offered in 1969-70.

[452. TALMUDIC ARAMAIC]

Spring term. Credit four hours. Prerequisite, Hebrew 305 or consent of the instructor. Not offered in 1969-70.

453-454. SYRIAC

Throughout the year. Credit four hours a term. Prerequisite, Hebrew 201, Arabic 208, or consent of the instructor. Hours to be arranged. Mr. Rabinowitz.

The classical language and literature of Syrian and Mesopotamian Christianity.

472. SEMINAR: THE DOCTRINE OF SACRED SCRIPTURE IN EARLY JEWISH LITERATURE

Spring term. Credit four hours. Prerequisite, Hebrew 302 or consent of the instructor. Hours to be arranged. Mr. Rabinowitz.

The seminar will study the assumptions as to the nature and efficacy of sacred Scripture found operative in the apocryphal literature, the Qumran Scrolls, and early rabbinic literature.

401. INDEPENDENT STUDY

Either term. Credit two hours. For qualified students. Staff.

402. INDEPENDENT STUDY

Either term. Credit four hours. For qualified students. Staff.

Arabic

105-106. ELEMENTARY LITERARY ARABIC

Throughout the year. Credit three hours a term. First term prerequisite to the second. T Th S 12:20. Mr. Young.

207-208. INTERMEDIATE LITERARY ARABIC

Throughout the year. Credit three hours a term. Prerequisite, Arabic 106 or consent of the instructor. T Th S 11:15. Mr. Young.

Rapid reading of selected texts in the main genres of Arabic literature.

317. ISLAMIC TEXTS IN ARABIC

Fall term. Credit four hours. Prerequisite, Arabic 208 or consent of the instructor. Hours to be arranged. Mr. Ivry.

Study of a number of *sūrāhs* of the Koran and of *hadīths* selected from the *Sahīh* of al-Bukhārī.

[318. ARABIC GEOGRAPHERS AND HISTORIANS]

Spring term. Credit four hours. Prerequisite, Arabic 208 or consent of the instructor. Not offered in 1969-70.

461. MEDIEVAL ARABIC *BELLES LETTRES* ('ADAB)

Fall term. Credit four hours. Prerequisite, Arabic 317 or 318, or consent of the instructor. Hours to be arranged. Mr. Ivry.

Texts read will include selections from ibn Khallikān's *Biographical Dictionary*, the *Thousand and One Nights*, al-Jāhiz's *Book of Misers*, the *Memoirs of Usāma ibn Munqidh*, etc.

462. ARABIC PHILOSOPHERS

Spring term. Credit four hours. Prerequisite, Arabic 317 or 318, or consent of the instructor. Hours to be arranged. Mr. Ivry.

Texts illustrative of the thought of a major Islamic philosopher.

[491. SEMINAR]

Fall term. Credit four hours. Open to qualified undergraduate and graduate students. Not offered in 1969-70.

405. INDEPENDENT STUDY

Either term. Credit two hours. For qualified students. Staff.

406. INDEPENDENT STUDY

Either term. Credit four hours. For qualified students. Staff.

Honors Courses

370. HONORS COURSE

Spring term. Credit four hours. To be taken in the junior year.

A program of readings and consultations devoted to an author or topic to be made known in advance of the term.

371-372. SENIOR HONORS COURSE

Throughout the year. Credit four hours a term. First term prerequisite to the second.

Continuation of 370 with change of author or topic.

Semitic Literature in Translation

107. CLASSICS OF JEWISH AND ISLAMIC THOUGHT

Fall term. Credit three hours. T Th 10:10 and a third hour to be arranged. Open to freshmen (See Freshman Humanities Program, p. 37) and sophomores. Mr. Ivry.

Readings, in translation, of selections from the several most important literary creations of Judaism and Islam.

110. THE LITERATURE OF THE NEW TESTAMENT

Spring term. Credit three hours. T Th S 10:10. Open to freshmen (See Freshman Humanities Program, p. 37) and sophomores. Mr. Carmichael.

An introduction to modern critical study of the New Testament.

THE LITERATURE OF THE OLD TESTAMENT

(Comparative Literature 301)

Fall term. Credit four hours. M W F 9:05. Mr. Rabinowitz.

[THE LITERATURE OF POST-EXILIC ISRAEL]

(Comparative Literature 302)

Spring term. Credit four hours. Not offered in 1969-70.

LITERARY STUDIES IN CHRISTIAN ORIGINS

(Comparative Literature 303)

Fall term. Credit four hours. M W F 10:10. Mr. Carmichael.

THE RATIONAL TRADITION IN JEWISH AND ISLAMIC LITERATURE

(Comparative Literature 304)

Spring term. Credit four hours. M W F 11:15. Mr. Ivry.

SOCIOLOGY

Mr. J. M. Stycos, Chairman; Mr. C. Ackerman, Mrs. Rose K. Goldsen, Messrs. G. Gordon, D. P. Hayes, N. Henry, W. W. Lambert, P. G. Marden, R. McGinnis, L. Meltzer, M. W. Meyer, D. I. Pool, D. T. Regan, B. C. Rosen, W. H. Starbuck, G. F. Streib, N. Tavuchis, W. F. Whyte, R. M. Williams, Jr.

Sociology Major

A. GENERAL SOCIOLOGY

For a major in sociology, the following courses must be completed:

(a) Prerequisites: A student applying for admission to the major must

have completed Sociology 101 and one 200 level sociology course. In addition, he must present two other courses in related subjects, typically to be chosen from Industrial and Labor Relations 210 (Statistics I), Mathematics 111 (Calculus), Philosophy 212 (Introduction to Logic), and Linguistics 201 (Introduction to the Scientific Study of Language). In special cases, however, other preparatory courses may be more relevant to the student's choice of concentration within sociology (e.g., courses in biological sciences for a concentration in demography or ecology; courses in computer science and/or engineering for systems analysis). In such cases, the Undergraduate Committee will judge the appropriateness of the courses.

(b) Upperclass Courses: A student accepted in the major must complete thirty-two hours of courses at the 300 level or higher, chosen in consultation with, and with the consent of, his adviser. Realizing the variety of other academic interests and career intentions to which sociology is relevant (for example, law, public service and government) and which a major in sociology should serve, the Department wishes to allow each student and his adviser freedom to construct an appropriate sequence of courses. (Students not presenting ILR 210 and Mathematics 111 among their preparatory courses will include among the thirty-two hours one course in the techniques of research; for example, research design, data collection and analysis.)

(c) Senior Year Requirement: All students will either (i) include within their thirty-two hours of advanced courses a graduate seminar during their senior year, writing for the seminar a comprehensive term paper, or (ii) present to the Department during their last term of residence a substantial essay on empirical or library research.

B. SPECIAL PROGRAMS

The Department of Sociology participates in two interdepartmental programs: Social Psychology, in cooperation with the Department of Psychology; and Social Relations, in cooperation with the Department of Anthropology. These have special requirements, as follows:

Sociology with a Concentration in Social Psychology

Sociology majors who wish to specialize in social psychology must meet the requirements set for a major in general sociology. To ensure a solid interdisciplinary grounding, students in the concentration will be permitted to include in the major courses in psychology and related fields. Advisers will assist the student in the selection of a coherent set of courses in social organization, cultural anthropology, experimental psychology, social methodology, and several aspects of social psychology. Seniors in the concentration may elect graduate seminars.

Social Relations Major

The major in social relations provides the student with basic competence in cultural anthropology, social psychology, and sociology, while giving

particular emphasis to the common methods of research in these disciplines. The student electing this major is expected to obtain a grasp of the common interests and evidence of these disciplines as well as knowledge of their unique insights in attempting to develop generalizations regarding man in society. The student's work is integrated in his senior year when he takes the social relations seminar in which he is expected to interrelate aspects of the theory and data of the three disciplines.

1. **PREREQUISITES TO THE MAJOR:** The candidate must apply to the Committee on Admission to the Social Relations Major, offering the following:

- a. Either Anthropology 101 or Sociology 101.
- b. Either Psychology 101 or 102, or Child Development 115 or Sociology 281.
- c. Either Industrial and Labor Relations 210 or equivalent.

2. **THE MAJOR:** The major calls for a minimum of thirty-six hours of course work as follows:

a. Three pairs or other combinations of related courses at the 300 level or above, to be selected in consultation with the major adviser. These six courses must include two courses from each of the following disciplines: anthropology, social psychology, sociology.

b. At least one course in methods, to be selected from the following: anthropological methods, techniques of experimentation (psychology), methods in sociology, advanced psychological statistics, the philosophy of science or of social science, advanced statistics (such as Industrial and Labor Relations 311).

c. At least one course in theory which is related to social relations.

d. The senior seminar in social relations (Sociology 497, or Anthropology 495).

A list of the courses which may be used to satisfy the requirements for a major in social relations is available from any of the major advisers.

Students seeking admission to the program in social relations should apply to the Chairman of the Social Relations Committee, Mr. Williams.

Seminars

Seminars may be taken by qualified undergraduates with the consent of the instructor, except as otherwise noted in course listings.

The Honors Program

For admission to the Honors Program, students should file application with the Program coordinator, Mr. Tavuchis, not later than November 1 of their junior year. Honors candidates must have a general average of at least B- and an average in departmental courses of at least B, or show exceptional promise.

Distribution Requirement

The Distribution requirement in social sciences is satisfied in sociology by Sociology 101 and an additional semester course at the 200 or 300 level.

Participation in Research

Participation in sociological research may be required as part of course work for any student when the instructor considers that it will be to the student's educational advantage.

101. MAN IN SOCIETY

Fall term. Credit three hours. M W F 9:05. Mr. Ackerman.

An introduction to the principal questions and perspectives of sociology. The focus will be upon the history and findings of the analysis of the processes which maintain the continuity and stability of society and which contribute to its change.

PERSONALITY AND SOCIAL BEHAVIOR

(Psychology 102)

Spring term. Credit three hours. M W F 11:15. Mr. Jones.

202. UNDERGRADUATE SEMINAR IN SOCIOLOGY

Spring term. Credit three hours. Prerequisites, Sociology 101 and consent of the instructor. T Th (S) 10:10. Mr. Hayes.

Stresses active student participation in the classroom and in laboratory and field research. Readings in the original sources will emphasize major contemporary issues.

230. POPULATION PROBLEMS

Spring term. Credit three hours. M W 12:20, and one hour to be arranged. Mr. Stycos.

The practical and scientific significance of population growth and composition. Fertility, migration, and mortality in relation to social and cultural factors and in relation to questions of population policy. National and international data will receive approximately equal emphasis.

[248. POLITICS IN SOCIETY]

Spring term. Credit three hours. Prerequisite, Sociology 101 or consent of the instructor. Mr. Ackerman. Not offered in 1969-70.

262. PUBLIC OPINION

Spring term. Credit three hours. M W F 11:15. Mrs. Goldsen.

Factors determining the character of public opinion on the basis of relevant social, psychological, and political science knowledge. The nature, development, and control of public opinion in terms of opinion formation and change and the relation of public opinion to social and political action. The role of the communication media of radio, television, press, and motion pictures in determining public opinion. Students will be asked to participate in a field study examining opinion on a current issue of public interest.

264. INTERGROUP RELATIONS: PREJUDICE, DISCRIMINATION, AND CONFLICT

Spring term. Credit three hours. Prerequisite, Sociology 101 or consent of the instructor. T Th S 11:15. Mr. Williams.

An evaluation of relations among ethnic, racial, and religious groups in terms of the social psychology of intergroup hostility and conflict and the position and role of these groups in the larger community. Prejudice and discrimination will be analyzed for their social, psychological, political, and economic causes and effects. Social and political movements based on intolerance and efforts to resolve intergroup conflict will be examined, with special attention to current developments resulting from the desegregation of public schools.

281. INTERPERSONAL RELATIONS AND SMALL GROUPS

(Also Psychology 281)

Fall term. Credit three hours. Prerequisite, Sociology 101, Psychology 102, or Child Development 115. M W F 11:15.

The presentation and development of selected theories offered to account for the dynamics of interpersonal relationships and the social structures which emerge from, and condition, these relationships. Emphasis will be upon social psychological processes in small groups, such as athletic teams, committees, fraternities and engaged couples. These perspectives are compared and evaluated.

284. SOCIAL-PSYCHOLOGICAL APPROACHES TO SOCIAL PROBLEMS

(Also Psychology 284)

Spring term. Credit four hours. Prerequisite, one course in psychology or sociology. T Th 10:10 and one hour to be arranged. Mr. Meltzer.

Students will read extensively in modern and classic attempts to explicate social and personal problems. The approaches of several theories—psychoanalytic, cognitive, behavioral, and role—will be considered in relation to topics such as personal rigidity, stigmata, conformity, prejudice, hysterical contagion, deviance, mental illness, conflict, intergroup relations, and social engineering. Lectures will evaluate these perspectives in terms of recent research.

321. TECHNIQUES OF SOCIOLOGICAL RESEARCH

Fall term. Credit four hours. Prerequisites, Sociology 101 and a course in statistics, or consent of the instructor. T Th S 10:10. Mr. Henry.

Strategies in the framing and testing of sociological hypotheses are considered. Data-gathering techniques are evaluated, with emphasis on the analysis of data from sample surveys.

332. URBAN COMMUNITIES

Spring term. Credit four hours. Prerequisite, Sociology 101 or consent of the instructor.

The study of urban aggregates as ecological, social, and cultural systems. The structure of urban communities will be studied both from the perspective of the larger, environing social and cultural system and from the perspective of internal relationships of institutions within the community. Patterns of community power structure and political participation will be examined within this context.

341. SOCIOLOGY OF EDUCATION

Fall term. Credit four hours. Prerequisite, Sociology 101 or consent of the instructor. T Th S 11:15.

An examination of educational institutions in the context of contemporary social and cultural developments. The structure of educational institutions, both American and foreign, and the interrelationships between educational and other institutions will be studied.

343. THE FAMILY

Fall term. Credit four hours. Prerequisite, Sociology 101 or consent of the instructor. M W F 10:10. Mr. Tavuchis.

The structure and function of the nuclear family and the extended family in the West and cross-culturally. Specific areas which will be examined include biological foundations, mate selection, illegitimacy, sexual controls, internal familial processes, disorganization, the family and stratification, changes in family systems.

346. SOCIAL STRATIFICATION

Spring term. Credit four hours. Prerequisite, Sociology 101 or consent of the instructor. M W F 1:25-2:15. Mr. Tavuchis.

An overview of various theories and empirical investigations of social stratification considered historically and cross-culturally.

350. COMPARATIVE SOCIAL STRUCTURE AND CHANGE

Spring term. Credit four hours. Prerequisite, Sociology 101. M W F 11:15. Mr. Rosen.

An examination of social and psychological factors which affect the modernization process. Emphasis is placed upon cross-national data which show how social structure and personality interact to influence the transition of communities from traditional to modern forms of social organization. Among the topics to be covered are psychological factors in economic development, the impact of industrialization on family structure and socialization, and personality elements which affect the political process in developing societies.

[351. SOCIOLOGY OF DEVIANCE]

Fall term. Credit four hours. Prerequisite, Sociology 101. Offered in alternate years. M W F 12:20. Mr. Ackerman. Not offered in 1969-70.

354. RELIGION AND SECULARISM IN WESTERN SOCIETY

Fall term. Credit four hours. Prerequisite, Sociology 101 or consent of the instructor. M W (F) 9:05. Mr. Streib.

The interrelationship of culture, society, and religion. Religion and social stratification, religion and economic and political institutions, social change and religion. The major emphasis will be upon American society and American religious institutions.

362. ECONOMIC DEVELOPMENT AND SOCIAL EVOLUTION

Fall term. Credit four hours. Prerequisite, Sociology 101. M W F 12:20. Mr. Ackerman.

Applies sociological concepts and theories of change and evolution to the historical development of Western industrial society. Examines such concepts and theories with respect to their relevance to the newly emergent nations. Is intended as a general introduction to "problems of modernization."

381. SOCIAL PSYCHOLOGY

(Also Psychology 381)

Either term. Credit four hours. Prerequisites, three hours of psychology and three hours of sociology. M W F 10:10. Spring term, Mr. Lambert.

Analysis of the history, concepts, methods, and theories used to describe and conceptualize the ways in which people react to one another in social settings and in the laboratory. Students will work individually or as teams on projects, using experimental or other empirical methods. The topics for investigation in lectures and reading will include socialization, attitude change, communication, interpersonal influence, impression formation, leadership, and propaganda.

385. THEORIES OF PERSONALITY

(Also Psychology 385)

Fall term. Credit four hours. Prerequisite, Psychology 101 or 102 or consent of the instructor. M W F 12:20. Mr. Lambert.

A critical survey of the concept of personality in literature, the social sciences, and psychology. A number of the modern specialists will be discussed at some length, and recent empirical and experimental work that has grown out of their thought will be analyzed. The empirical relation of personality notions to some philosophical beliefs and literary productions will be considered. The emphasis will be mainly upon "normal" personality.

387. PSYCHOLOGICAL ASPECTS OF POLITICAL BEHAVIOR

(Also Psychology 387)

Fall term. Credit four hours. Prerequisites, junior status and a course in social psychology, or consent of the instructor. M W F 9:05. Mr. Alker.

A survey covering the authoritarian personality, political paranoia, affective determinants of "left" and "right" ideology, characteristics of active political participants, Machiavellianism, stress and political decision making, need for power, and political attitude change. An empirical, hypothesis-testing approach will be adopted.

402. SOCIAL THEORY

Fall term. Credit four hours. Prerequisite, consent of the instructor. W 1:25-3:20 and one hour to be arranged.

Survey of selected theories and concepts in contemporary sociology reviewed in historical perspective, in relation to the contributions of other social sciences, and in terms of present-day developments in theory and research. Throughout, emphasis will be placed on trends in contemporary social theory.

420. INTRODUCTION TO MATHEMATICAL SOCIOLOGY

Spring term. Credit four hours. Prerequisites, Sociology 101 and one year of college mathematics, or consent of the instructor. Th 1:25-3:20 and one additional hour. Mr. McGinnis.

Elementary mathematics as applied to sociological theory. Both deterministic and probabilistic models are considered. Stochastic probability processes are emphasized in relation to theories of social change.

423. ANALYSIS OF QUANTITATIVE DATA

Fall term. Credit four hours. Prerequisite, major or graduate standing or consent of the instructor. Hours to be arranged.

In the first semester, quantitative materials from current studies are analyzed by students. Problems of editing, classifying and coding data are dealt with in the laboratory sessions. Students are expected to learn how to use IBM unit record equipment in their analyses. Scales, scores and composite indexes are developed and used in the analyses. Students are expected to write their exercises as weekly research reports, which are annotated by the instructor and discussed in class.

424. ANALYSIS OF QUALITATIVE DATA

Spring term. Credit four hours. Prerequisite, major or graduate standing or consent of the instructor. Hours to be arranged.

This is the continuation of Sociology 423. The second semester emphasizes the equivalent problems which arise in analyzing qualitative research data.

433. INTERNATIONAL URBANIZATION

Fall term. Credit four hours. Prerequisite, background in the social sciences or consent of the instructor. M W F 11:15. Mr. Marden.

An examination of the nature of urbanization in developed and developing nations. The growth, nature, and problems of urban centers will be considered. Careful attention will be directed to the sociological questions involved in urbanization and urbanism, but other perspectives on cities will be employed as appropriate. Students will have an opportunity to develop their own interests on urbanization in international contexts during the course.

[435. MORTALITY AND MORBIDITY]

Fall term. Credit four hours. Prerequisite, Sociology 230 or consent of the instructor. Mr. Marden. Not offered in 1969-70.

438. HUMAN MIGRATION

Spring term. Credit four hours. Prerequisite, Sociology 230 or consent of the instructor. T Th S 11:15.

An analysis of international and internal migration as it affects the social and economic structure of societies and the groups in movement. The major theoretical and methodological investigations will be examined from such varied perspectives as individual motivation and mathematical models of migration.

INTRODUCTION TO HUMAN ECOLOGY

(Planning 713, College of Architecture, Art and Planning)

Spring term. Credit three hours. T Th 8:35-9:55. Mr. Feldt.

An examination of the form and development of the human community with respect to spatial, temporal, and functional patterns of organization. Demographic, environmental, and technological characteristics are treated as parameters relevant to the ecological structure of the community.

441. STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY—I

Fall term. Credit four hours. Prerequisite, Sociology 101 or consent of the instructor. T Th S 9:05. Mr. Williams.

Systematic analysis of the major institutions of kinship, stratification, economic activity, political structure, education, and religion. Special attention is given to values and their interrelations in the modern social order. A survey of the more important types of groups and associations making up a pluralistic nation is included.

442. STRUCTURE AND FUNCTIONING OF AMERICAN SOCIETY—II

Spring term. Credit four hours. Prerequisite, Sociology 441 or consent of the instructor. T Th S 9:05. Mr. Williams.

Primary attention is directed to the study of interrelations of institutions, including analysis of the regulation of economic and political systems. Group cooperation and conflict are surveyed. Analysis of important processes of change in institutions, values, and social organizations.

447. SOCIOLOGY OF HEALTH AND MEDICINE

Fall term. Credit four hours. Prerequisite, background in the social sciences, premedical status, or consent of the instructor. M W F 12:20. Mr. Marden.

An analysis of health, illness, and the health professions and institutions from the sociological perspective. Topics to be considered will include social epidemiology, mortality and morbidity, and social psychology of illness, the socialization of health professionals, the organization of health care, and patient-professional relationships. Some attention will be directed to health and medical care in developing areas.

INDIVIDUAL DIFFERENCES AND PERSONALITY

(Psychology 410)

Spring term. Credit four hours. Prerequisites, seven hours of psychology, junior or senior standing, or consent of the instructor. M W F 10:10. Mr. Alker.

480. ATTITUDES AND ATTITUDE CHANGE

(Also Psychology 480)

Spring term. Credit four hours. Prerequisites, three hours of psychology and three hours of sociology. M W F 11:15. Mr. Regan.

A systematic survey of theory and research on attitudes and attitude change.

481. ADVANCED SOCIAL PSYCHOLOGY

(Also Psychology 481)

Fall term. Credit four hours. Prerequisite, a course in social psychology or consent of the instructor. M W F 11:15. Mr. Regan.

Emphasis is on the empirical study of social psychological phenomena. Students will be introduced to empirical laboratory and field methods used in social psychology. Substantive problems will provide the focus for the demonstration and use of these techniques.

483. SOCIAL INTERACTION

(Also Psychology 483)

Fall term. Credit four hours. Prerequisites, written consent of the instructor and three hours in psychology and three hours in sociology. Hours to be arranged. Mr. Hayes.

A field and laboratory course dealing with the major dimensions of interpersonal perception and behavior. The relation of these dimensions to self-conception, social roles, group structure, and dynamics are examined. Contemporary research is stressed in the readings. Student projects are an integral part of the course.

484. EXPERIMENTAL GROUP DYNAMICS

(Also Psychology 484)

Spring term. Credit four hours. Prerequisites, a course in statistics and a course in social or experimental psychology. W 1:25-3:20 and additional laboratory time to be arranged. Mr. Meltzer.

A practicum. Supervised research experience in the design, execution, and analysis of experimental research on topics such as group cohesiveness, group pressure, group goals, leadership, group performance, and interpersonal influence and communication. Students will read and discuss experimental studies as well as pertinent theoretical articles.

486. GROUPS AS SOCIALIZING AGENTS

(Also Psychology 486)

Spring term. Credit four hours. Prerequisites, two courses in psychology or

sociology and upperclass or graduate standing. T 1:25-3:20. Mr. Bronfenbrenner.

The course examines critically existing theory and research on the role of groups in shaping the behavior and values of their members. Particular attention is focused on such processes as modeling, social reinforcement, and pressures to conform in enduring social structures such as the family, the peer group, work teams, and business organizations. Students are expected to work independently in assembling and evaluating material relevant to particular issues.

[488. INDIVIDUAL AND SOCIETY IN THE SOVIET UNION]

(Also Psychology 488)

Spring term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged. Will be conducted as a seminar. Mr. Bronfenbrenner. Not offered in 1969-70.

489. SEMINAR: SELECTED TOPICS IN SOCIAL PSYCHOLOGY

(Also Psychology 489)

Either term. Credit four hours. Prerequisites, consent of the instructor and three hours of psychology and three hours of social psychology or sociology. Hours to be arranged. Fall term: Mr. Jones.

A small discussion seminar dealing with issues in both social and personality psychology. Fall term: Initial discussions will focus on specific areas of the field such as interpersonal evaluation, attitude change, and group processes. Subsequently, the discussions will become more general and raise such questions as what are the major themes social psychologists are or should be studying and what are the appropriate units of analysis of social behavior. Spring term: Topics to be announced.

491. SELECTED TOPICS IN SOCIOLOGY

Either term. Credit two hours. Open only to majors. Hours to be arranged. Staff.

492. SELECTED TOPICS IN SOCIOLOGY

Either term. Credit four hours. Open only to majors. Hours to be arranged. Staff.

494. HONORS SEMINAR: JUNIOR YEAR

Spring term. Credit four hours. Prerequisite, acceptance as candidate for Honors. Hours to be arranged. Staff.

495. HONORS RESEARCH: SENIOR YEAR

Fall term. Credit four hours. Prerequisite, Sociology 494. Hours to be arranged. Staff.

496. HONORS THESIS: SENIOR YEAR

Spring term. Credit four hours. Prerequisite, Sociology 495. Hours to be arranged. Staff.

497. SOCIAL RELATIONS SEMINAR

(Also Anthropology 495)

Fall term. Credit four hours. Open only to seniors majoring in social relations. Hours to be arranged.

501. THE METROPOLITAN COMMUNITY

(Also Planning 714, College of Architecture, Art, and Planning and Rural Sociology 511, College of Agriculture)

Fall term. Credit four hours. F 1:25-4. Prerequisite, graduate student standing or consent of an instructor. Messrs. Marden, Feldt, and Eberts.

An interdisciplinary course focused upon social, political, and economic aspects of metropolitan communities. Viewed from the perspectives of demography, ecology, social organization, and planning, it will consider the emergence of a new societal form and its implications for contemporary America.

[520. MATHEMATICAL MODELS]

Spring term. Credit four hours. Prerequisites, courses in calculus and probability or consent of the instructor. Not offered in 1969-70.

522. SURVEY OF SOCIOLOGICAL METHODS

Spring term. Credit four hours. Prerequisites, Sociology 321 and a statistics course, or consent of the instructor. Hours to be arranged.

A survey of contemporary social science research techniques that emphasize interdisciplinary methodological convergences. Investigators from several disciplines report on research problems that are encountered and techniques that are used to cope with them.

523. FOUNDATIONS OF STATISTICAL ANALYSIS

Fall term. Credit four hours. Prerequisite, a course in statistics or consent of the instructor. W 3:35-5:30 and one hour to be arranged.

The logic of social research; sets and relations; measurement; probability models.

524. RESEARCH DESIGN AND STATISTICAL INFERENCE

Spring term. Credit four hours. Prerequisite, Sociology 523 and a course in statistics, or consent of the instructor. W F 3:20-5. Mr. Henry.

The logic of statistical inference, experimentation, and decision theory. Measures of association for cross-classification. Causal analysis of multivariate relations, using regression analysis and related techniques.

526. STOCHASTIC PROCESSES IN SOCIOLOGY

Spring term. Credit four hours. Prerequisites, one year of college mathematics and one term of statistics, or consent of the instructor. W 3:35-5:30 and one hour to be arranged. Mr. McGinnis.

Finite probability theory is reviewed. Recurrent events, stationary Markov chains, and dynamic Markov processes are evaluated as models of social organization and change.

528. MEASUREMENT AND LATENT STRUCTURE THEORY

Fall term. Credit four hours. Prerequisite, 524 or consent of the instructor. Hours to be arranged. Mr. Henry.

The problem of index construction and classification is the focus for a study of factor analysis, latent structure analysis, and nonmetric multidimensional scaling procedures. Emphasis will be on the logic of models and their relation to social theory and data. Computer routines for these procedures will be used.

530. INTRODUCTION TO DEMOGRAPHY

Spring term. Credit four hours. Prerequisite, graduate student standing or consent of the instructor. Hours to be arranged. Staff.

A survey of the methods, theories, and problems of contemporary demography. Special attention is directed to the social determinants and consequences of fertility, mortality, and migration. The populations of developed and developing nations will be examined.

[531. DEMOGRAPHIC THEORY]

Fall term. Credit four hours. Open to majors and graduate students. T 1:25-3:20. Not offered in 1969-70.

535. TECHNIQUES OF DEMOGRAPHIC ANALYSIS

Fall term. Credit four hours. Prerequisite, Sociology 230 or consent of the instructor. T Th S 11:15.

Methods of processing and analyzing demographic data. Measures of mortality, fertility, and migration as applied to census and vital statistics data will be analyzed, and the more general applications of demographic techniques to other classes of data illustrated.

536. DEMOGRAPHIC RESEARCH METHODS

Spring term. Credit four hours. Prerequisite, Sociology 230 or consent of the instructor. M W F 11:15.

Research application of basic demographic techniques to selected regions of the world, particularly the economically less developed regions. Attention is directed to field survey techniques, including sampling and questionnaire construction, as well as formal demographic analysis. Students may work on selected research projects for the semester.

539. POPULATION IN TROPICAL AFRICA

Fall term. Credit four hours. Prerequisite, Sociology 230 or consent of the instructor. T 7:30-9:30 P.M. and one hour to be arranged. Mr. Pool.

The study of population trends in Tropical Africa. Analyses will be made of the basic demographic factors: sources of data; levels of mortality and fertility; migration and urbanization; population problems and population policies. An attempt will be made to determine research priorities and strategies in African population studies.

541. SOCIAL ORGANIZATION AND CHANGE

Fall term. Credit four hours. Prerequisite, graduate student standing or consent of the instructor. T 2:30-3:20, Th 1:25-3:20. Mr. Williams.

An analysis of major problems in theory and research in the general field of social organization and change. The subject will be studied from the standpoint of the nature and size of the social system (small groups, communities, large-scale organizations, societies) and also in terms of the social processes and properties of the system, such as integration, authority, conformity, and deviance.

543. FAMILY, KINSHIP, AND SOCIETY

Fall term. Credit four hours. Prerequisites, graduate student standing or consent of the instructor. Hours to be arranged. Mr. Tavuchis.

A systematic analysis of the nuclear family, extended family systems, and corporate kinship groups cross-culturally and historically. The relation of family structures to other institutional areas; for example, economy, polity, stratification and their relations to specific social processes such as demographic events, social disorganization, mobility.

[545. ORGANIZATION THEORY]

Fall term. Credit four hours. Prerequisite, consent of the instructor. M 1:25-3:20 and one hour to be arranged. Mr. Starbuck. Not offered in 1969-70.

METHODS OF SOCIAL ANALYSIS IN SOCIAL PSYCHOLOGY
(Psychology 545-546)

Either term. Credit four hours.

583-584. PROSEMINAR IN SOCIAL PSYCHOLOGY
(Also Psychology 583-584)

Either term. Credit four hours.

Critical analysis of the major current theories and research in social psychology.

585. SOCIAL STRUCTURE AND PERSONALITY
(Also Psychology 585)

Fall term. Credit four hours. Prerequisite, graduate student standing or consent of the instructor. T 3:35-5:30. Mr. Rosen.

A discussion seminar examining the impact of structural factors on personality development, and on the ways in which individual internal states and behavioral patterns affect the functioning of social systems.

602. SEMINAR: THEORY

Spring term. Credit four hours.

[621-622. SEMINAR: ISSUES IN THE METHODOLOGY OF THE SOCIAL SCIENCES]

Either term. Credit four hours. Not offered in 1969-70.

632. SEMINAR: CONTEMPORARY RESEARCH IN DEMOGRAPHY

Spring term. Credit four hours. T 3:35-5:30. Mr. Stycos.

Critical analysis of recent research investigations in Latin American demography.

633. SEMINAR: COMPARATIVE URBANIZATION

Fall term. Credit four hours. Prerequisite, graduate student standing or consent of the instructor. Hours to be arranged. Mr. Marden.

An analysis of processes, problems, and prospects of urbanization in an international context. Comparisons with other variables of social change will be considered. The growth, nature, and roles of urban centers will be examined. Urbanization will be viewed from an interdisciplinary perspective. Attention will be directed to possible comparisons between developed and developing nations in this regard.

[634. SEMINAR: POPULATION, HISTORY, AND SOCIETY]

Spring term. Credit four hours. Hours to be arranged. Messrs. Marden and Tavuchis. Not offered in 1969-70.

636. SEMINAR: MANPOWER RESEARCH

Spring term. Credit four hours. Hours to be arranged.

641. SEMINAR: THEORY AND RESEARCH

Fall term. Credit four hours. Hours to be arranged.

643. SEMINAR: THEORY AND RESEARCH

Fall term. Credit four hours.

657. SEMINAR: SOCIAL CHANGE AND THE COMMUNITY

Spring term. Credit four hours. W 3:35-5:20. Mr. Streib.

The seminar will concentrate upon the topics of leadership, religious organizations, and the process of social change.

659. SEMINAR: SOCIOLOGY OF ADULTHOOD AND AGING

Fall term. Credit four hours. Prerequisite, consent of the instructor. M 3:35-5:20. Mr. Streib.

The focus will be upon the latter half of the life cycle and will utilize both institutional and social psychological frameworks. Theory and research related to the following topics will be discussed: the middle aged and the elderly in relation to family, economy, and the polity; demographic trends and issues; social aspects of health; adult socialization; role changes and role crises. Some topics will receive more attention than others from year to year depending upon the background and interests of the students.

661. SEMINAR: TOPICS IN PARSONSIAN ANALYSIS

Spring term. Credit four hours. Prerequisite, major in the field of Sociology. M 3:35-5:30. Mr. Ackerman.

Concepts and theories. Empirical referent will vary from year to year.

662. SEMINAR: SOCIAL SYSTEMS ANALYSIS

Spring term. Credit four hours. Hours to be arranged. Mr. Starbuck.

Foundations of systems analysis.

663. SEMINAR: SOCIAL SYSTEMS ANALYSIS

Fall term. Credit four hours. Hours to be arranged. Messrs. Henry and Starbuck.

Foundations of social systems analysis.

681-682. SEMINAR IN SOCIAL PSYCHOLOGY

(Also Psychology 681-682)

Either term. Credit four hours.

Research oriented analysis of selected topics in social psychology.

683. RESEARCH PRACTICUM IN SOCIAL PSYCHOLOGY

(Also Psychology 683)

Fall term. Credit four hours. Hours to be arranged. Mr. Hayes.

The focus will be upon linking social psychological and social organizational analysis.

685. SEMINAR: SOCIAL PSYCHOLOGY OF MODERNIZATION

Spring term. Credit four hours. Hours to be arranged. Mr. Rosen.

An analysis of the interacting effects of social structure and personality on social change in developing countries.

687-688. SOCIAL PSYCHOLOGY AND PERSONALITY COLLOQUIA

(Also Psychology 687-688)

Either term. Credit two hours. W 4:00-5:30. Mr. Meltzer and visiting staff.

Weekly lectures by visiting and Cornell faculty, sponsored by the Interdepartmental Program in Social Psychology and Personality, are open to the

general public. Graduate students may earn credit by regular attendance, reading selective writings by each speaker, and writing an integrative term paper. Each semester the colloquia will concentrate on a new theme.

691-692. DIRECTED RESEARCH

Either term. Credit to be arranged. Hours to be arranged. Staff.

THEATRE ARTS

Mr. J. Clancy, Chairman; Messrs. H. D. Albright, G. Beck, M. A. Carlson, S. R. Cole, Miss Peggy Lawler, Mrs. LaVerne Light, Messrs. D. Marme, P. Shortt, B. O. States, R. Sudre, A. Torg, B. Tucker, L. Turenne, and staff.

The Department of Theatre Arts offers a broad and varied curriculum dealing with theatre and related arts. All majors must complete the sequence 109-110 plus thirty additional hours of work in the Department, which must include 251-252 and at least two additional hours in courses numbered in the 250's. Upperclassmen accepted as majors who have not taken 109-110 must complete instead 209 and an additional course prescribed by the Department. In addition, majors must complete at least twelve hours of related work outside the Department. All majors must demonstrate proficiency in practical theatre work.

A special group of ten freshmen will be admitted each year whose abilities and interests are centered upon theatre as a profession. These Special Theatre Majors will have programs tailored to their specific needs permitting them to participate in their early undergraduate years in work normally reserved for upperclassmen. Many of their normal elective units will be taken within the Department. Each group of ten will be assigned an adviser at the beginning of the freshman year. For further information on qualifications for admittance to the Special Theatre Major, write the chairman of the Department of Theatre Arts.

Opportunities for performance in theatre, dance, and cinematography are available to all members of the student body through the facilities of the Department. A wide variety of theatrical performances is presented each term in the University Theatre of Willard Straight Hall, the Kaufmann Auditorium in Goldwin Smith Hall, and the Drummond Studio in Lincoln Hall. Students may participate as actors, dancers, directors, playwrights, film makers, designers, or technicians. Auditions for particular productions are scheduled throughout the year. Film-making equipment and facilities are available for student use.

Four prizes are offered under the auspices of the Department: the Heermans Prize for One-Act Plays on an American Theme (open to undergraduates), the George A. McCalmon Prize for One-Act Plays (open to graduates and undergraduates, with no restriction as to theme), the Cornell Dramatic Club First President's Prize for significant contributions to the theatre program, and the Cornell Student Film Festival Prize (open to graduates and undergraduates, with no restriction as to length or theme).

The Drummond Awards were established in honor of the late Professor A. M. Drummond, to acknowledge, each year, outstanding achievements by undergraduate members of the Cornell Dramatic Club and other undergraduate participants in the University Theatre program.

THE HONORS PROGRAM. Students wishing to graduate with Honors may undertake to work toward an Honors essay or an Honors production project. Those interested in working toward the essay should make application to the chairman by the first term of their junior year, those working toward the production project by the first term of their sophomore year. For provisional acceptance as a candidate for Honors, a student must have chosen theatre as his major, have a cumulative average of B- for all work done in the College, and have no grades below B- for courses in the Department. Successful candidates will be removed from provisional status at the end of their junior year, and as seniors must enroll in the Honors sequence 427-428.

DISTRIBUTION REQUIREMENT. The Distribution requirement in the expressive arts is satisfied by either the sequence 109-110 or a combination of 280 plus either 380, 282, 361, 367, or 388.

Theatre Laboratory

Each of the following courses (251-252, 253-254, 255-256 and 257-258) is offered throughout the year. Credit one hour a term. Consent of the instructor is required. The courses may be repeated for credit, but no student may earn more than six hours of credit applicable towards graduation. Acting, directing, managerial, and technical responsibilities in productions of the University Theatre and/or studio and cinema programs under the direction of the University Theatre staff. Participation is also open to students without credit.

251-252. TECHNICAL THEATRE

Credit one hour a term. First meeting in Lincoln 302 at 7:30 P.M. on the first day of instruction. Shop hours to be arranged. Mr. Torg. Only grades of S or U will be given.

Practice in construction, painting, and lighting for the University Theatre productions.

253-254. CINEMA PRODUCTION

Credit one hour per term. Hours to be arranged. First meeting in Lincoln 304 at 7:30 P.M. on the first day of instruction. Mr. Beck. Only grades of S or U will be given.

255-256. REHEARSAL AND PERFORMANCE

Credit one hour a term. First meeting in Lincoln 302 at 7:30 P.M. on the first day of instruction. Hours to be arranged. Staff. Only grades of S or U will be given.

257-258. MANAGEMENT AND DIRECTION

Credit one hour a term. First meeting in Lincoln 302 at 7:30 P.M. on the first day of instruction. Hours to be arranged. Staff. Only grades of S or U will be given.

Acting

280. BEGINNING ACTING

Fall term. Credit three hours a term. M W 3-5, T Th 3-5; T Th 11-1 (M.F.A. only). Mr. Cole and Mr. Turenne. Spring term: T Th 3-5. Mr. Cole.

Introduction to the problems and basic techniques of the actor. Practice in creative exercises, pantomime, and improvisation.

380. ADVANCED ACTING

Spring term. Credit four hours. Prerequisite, Theatre Arts 280 or consent of the instructor. M W 3-5, T Th 3-5; T Th 11-1 (M.F.A. only). Mr. Cole and Mr. Turenne.

Practical emphasis upon integration of conception, preparation of role and techniques of presentation.

265. VOICE AND SPEECH FOR PERFORMANCE

Fall term. Credit two hours. Primarily for M.F.A. candidates. Others by consent of the instructor. M W 10:10 and laboratory, M W 1:25-2:15 and laboratory. Mrs. Light.

A study of voice and speech variables and their nature when applied to theatrical performance. Emphasis is on ear training and the techniques of voice production to achieve precision of articulation, and to improve vocal range, resonance, and flexibility.

Laboratory sessions under supervision of the instructor include programmed self-instruction in General American and English phonetics, and work on individual voice and articulation problems.

266. VOICE AND SPEECH FOR PERFORMANCE

Spring term. Credit two hours. Prerequisite, 265. M W 10:10 and laboratory, M W 1:25 and laboratory. Mrs. Light.

Advanced voice and diction for the stage. Stage dialects studied through the combined approach of applied phonetics and ear training. Continued work in the techniques of voice production to improve range, resonance, and flexibility.

282-283. DANCE AND MOVEMENT FOR THE THEATRE

Throughout the year. Credit three hours a term. First term prerequisite to the second. F 1:30-3 plus one other period to be arranged. Miss Lawler.

Basic dance technique designed to help the actor improve his use of the body as an expressive instrument. Emphasis in the second term is on changing styles of movement.

MODERN DANCE TECHNIQUE

(Physical Education 210)

RHYTHMIC FUNDAMENTALS

(Physical Education 220)

DANCE COMPOSITION

(Physical Education 230)

285. WEAPONRY FOR THE THEATRE

Fall term. Credit two hours. Primarily for M.F.A. candidates. Hours to be arranged. Mr. Sudre.

Introduction to basic fencing techniques in Foil, Epee, and Sabre, with emphasis on stage adaptation and body mechanics.

286. WEAPONRY FOR THE THEATRE

Spring term. Credit two hours. Primarily for M.F.A. candidates. Prerequisite 285. Hours to be arranged. Mr. Sudre.

Duel mechanics and staging, stage tumbling and falling. Introduction to basic rules of body esthetics, dietetics, and introduction to body massage and physiotherapy, as applied to the performing arts.

385-386. AMERICAN MIME

Throughout the year. Credit two hours a term. First term prerequisite to the second. M 11-1 (primarily for M.F.A. candidates) or 2-4. Mr. Tucker.

The actor is taught to create and perform symbolic activities in the mime form. The first semester work is divided into acting, movement, and material. Emphasis in the second semester is on directing, design, and creative imagination. Work is completed by the creating and playing of scenes.

Directing

289. ACTING FOR THE DIRECTOR

Fall term. Credit three hours. T Th 3-5. Mr. Cole.

A study of the process of acting, the relationship between the director and the actor, coaching techniques, and the actor as the basic theatrical unit in directorial design. Lecture, demonstration, practice.

290. FIRST PRINCIPLES OF DIRECTING

Spring term. Credit three hours. Prerequisites, Theatre Arts 289 and consent of instructor. M W F 3-5. Mr. Clancy.

The study and practice of the fundamental craft of the director. The structure of visual and temporal patterns as interpretation of the script, rehearsal procedures and techniques; the relationship of the technical and design arts to the directorial approach.

Lecture, discussion, demonstration, and practice. Students will prepare scenes for class critique, demonstration, and revision.

[390. ADVANCED DIRECTING]

Not offered in 1969-70.

490. PROJECTS IN DIRECTING

Either term. Credit to be arranged. Prerequisite, consent of the departmental staff. Hours to be arranged. Staff.

The planning and execution of directing projects by advanced students in the public facilities of the Theatre Arts Department.

495. SEMINAR IN THEORIES OF DIRECTING

Fall term. Credit four hours. Prerequisite, graduate standing and/or consent of instructor. M 2-4:25. Mr. Clancy.

A study of the theory and practice of significant directors in theatre history. An examination of directorial interpretation and theatrical realization, with consideration of the social, philosophical, and cultural milieu in which the directors worked.

Theatre Production and Design

351-352. THEATRE PRACTICE

Throughout the year. Credit two hours. First meeting in Lincoln 302 at 8:30 P.M. on first day of instruction. Hours to be arranged. Staff.

Work on specific projects and/or productions under supervision of set designer, costume designer, or technical director.

361. STAGECRAFT

Either term. Credit four hours. M W 12:20. Laboratory hours to be arranged. Mr. Torg.

A survey of technical problems of stage production. Lectures and demonstrations on theatre structure and equipment, scene construction and painting, stage lighting and equipment, costume construction, and technical drawing. Practice in scene and costume construction, painting and lighting in both laboratory and actual productions.

364. STAGE DESIGN I

Fall term. Credit four hours. Prerequisite, Theatre Arts 361 or consent of the instructor. T Th 10:10. Laboratory, to be arranged. Mr. Shortt.

An historical survey of stage design. Projects in design and production concepts. Practice in rendering and presentation techniques. Field trip to New York City theatres and scene shops. Laboratory work with designer on scenic elements, stage lighting, and painting for Department productions.

365. STAGE DESIGN II

Spring term. Credit four hours. Prerequisite, Stage Design I or consent of the instructor. T Th 10:10. Laboratory, to be arranged. Mr. Shortt.

Continuation of Stage Design I.

367. COSTUME DESIGN I

Fall term. Credit four hours. T Th 12:20. Laboratory, M 2-4:25. Mr. Marme.

Stage costume design and construction. Practice in costume design, period research, rendering techniques. Laboratory in practical costume construction.

368. COSTUME DESIGN II

Spring term. Credit four hours. Prerequisite, Costume Design I or consent of the instructor. T Th 12:20. Laboratory M 2-4:25. Mr. Marme.

Continuation of Costume Design I.

467. ADVANCED COSTUME DESIGN

Fall term. Credit and hours to be arranged. Consent of instructor. Mr. Marme.

Projects in stage costume design and rendering techniques. Emphasis on design of total production. May be repeated for credit.

468. ADVANCED COSTUME CONSTRUCTION

Spring term. Credit and hours to be arranged. Consent of instructor. Mr. Marme.

Projects in application of historical patterning for the stage. May be repeated for credit.

Playwriting

388. PLAYWRITING

Fall term. Credit four hours. Previous study in play production recommended. W 1:25-4:25. Mr. States.

A laboratory for the discussion of student plays. Each student is expected to write two or three one-act plays, or one full length play.

389. ADVANCED PLAYWRITING

Spring term. Credit four hours. Prerequisite, consent of the instructor. Hours to be arranged. Mr. States.

A continuation of Theatre Arts 388.

Theatre History, Literature, and Theory

109-110. INTRODUCTION TO THEATRE ART

Throughout the year. Credit three hours a term. First term prerequisite to the second. M W F 11:15. Mr. Albright.

Study of the fundamental elements in theatrical production and of their interrelationships. The first term will be devoted primarily to the written script and its analysis for production, and to staging and design as they affect the work of actor and director.

In the second term the artistic choices of the actor and director in bringing a script to life on the stage will be given primary consideration. Material in both terms will be developed through lectures, readings, discussions, and demonstrations, as well as through individual and group exercises.

209. THE ARTS OF THE THEATRE

Fall term. Credit three hours. Not open to freshmen or to students who have taken Theatre Arts 109 or 110. M W F 12:20. Mr. Albright.

A survey of the elements of dramatic communication intended to develop appreciation and rational enjoyment of the theatre in all its forms. This is not a production course, and no experience in dramatic production is required. Lectures, readings, demonstrations.

300. INDEPENDENT STUDY

Either term. Credit to be arranged. Individual study of special topics. Open to juniors and seniors by consent of the departmental member directing the study.

393. HISTORY OF THE THEATRE I

Fall term. Credit four hours. M W F 10:10. Staff.

A survey of the characteristics of primitive theatre, and of theatrical styles and production modes in Classical Greece, Rome, Medieval Europe, Renaissance England, and Spain.

394. HISTORY OF THE THEATRE II

Spring term. Credit four hours. M W F 10:10. Mr. Carlson.

A survey of theatrical styles and production modes in Europe and the Orient since 1642. Among the areas considered will be Renaissance France, the English Restoration, the eighteenth and nineteenth centuries in England, France, Germany, and Japan, and the modern international stage.

WORLD DRAMA

(Comparative Literature 325-326)

EUROPEAN DRAMA 1660-1800

(Comparative Literature 347)

[GREEK AND ROMAN DRAMA]

(Comparative Literature 400)

Not offered in 1970.

REPRESENTATIVE ENGLISH DRAMAS

(English 339)

ELIZABETHAN AND JACOBEAN DRAMA

(English 412)

SHAKESPEARE

(English 368 and 413)

396. AMERICAN DRAMA AND THEATRE

Spring term. Credit four hours. T Th S 11. Staff.

A study of the American theatre and representative American plays with emphasis on the drama from O'Neill to the present.

MODERN DRAMA

(English 346 and 463, German Literature 412)

397. SURVEY OF THEATRICAL THEORY

Fall term. Credit four hours. M W F 11:15. Staff.

The development of the theory of the theatre in relation to theatrical practice from the Greeks to the eighteenth century.

398. SURVEY OF THEATRICAL THEORY

Spring term. Credit four hours. M W F 11:15. Staff.

The development of the theory of the theatre in relation to theatrical practice from the eighteenth century to the present.

427. HONORS SEMINAR

Fall term. Credit four hours. Prerequisite, senior standing as a candidate for Honors. Hours to be arranged. Members of the Department.

428. HONORS RESEARCH

Spring term. Credit to be arranged. Prerequisite, Theatre Arts 427. Hours to be arranged. Members of the Department.

MODERN DRAMATISTS

(Comparative Literature 442)

For complete descriptions of graduate courses see the *Announcement of the Graduate School: Humanities*.

493. SEMINAR IN THEATRE HISTORY

Fall term. Credit four hours. Prerequisites, graduate standing and consent of the instructor. M 2-4:25. Mr. Carlson.

Certain selected aspects in theatre history to be announced later.

497. THEATRE AESTHETICS

Fall term. Credit four hours. Prerequisites, two 300 level or 400 level courses in drama. Th 2-4:25. Mr. Albright.

The chief theories of dramatic production in relation to aesthetic principles.

597. SEMINAR IN THEATRE AESTHETICS

Spring term. Credit four hours. Prerequisites, graduate standing and consent of the instructor. F 2-4:25. Staff.

A study of illusion and empathy in the theatre.

[598. SEMINAR IN THEATRE CRITICISM]

Not offered in 1969-70.

690. THESES AND SPECIAL PROBLEMS IN DRAMA AND THE THEATRE

Cinema

253-254. CINEMA PRODUCTION

See listing under Theatre Production.

375. HISTORY OF THE CINEMA I

Fall term. Credit four hours. T Th 2-4:25. Mr. Beck.

An introduction to the history and art of the cinema: its characteristic problems, devices, and development. Representative motion pictures will be studied. Lectures, demonstrations, and film viewings.

376. HISTORY OF THE CINEMA II

Spring term. Credit four hours. T Th 2-4:25. Mr. Beck.

An examination of the nonfiction film and the independent film. Attention is given to the film maker as artist, propagandist, and recorder. Representative examples will be studied. Lectures, demonstrations, and film viewings.

377. FUNDAMENTALS OF CINEMATOGRAPHY

Fall term. Credit four hours. M W 2-4:25. Mr. Beck.

Principles and methods of motion picture production with primary emphasis on creative techniques: script writing, photography, editing, special effects, and sound recording. Lectures, demonstrations, and special projects.

475. SEMINAR IN THE CINEMA

Spring term. Credit four hours. Prerequisites, Theatre Arts 375 and 376. W 2-4:25. Mr. Beck.

Selected topics in the history and aesthetics of the cinema.

CENTER FOR INTERNATIONAL STUDIES

The purpose of the Center is to facilitate and encourage research and teaching dealing with international affairs and to serve as a focal point for their discussion. The Center's major effort is directed to strengthen the social sciences as they relate to international studies. The Center brings to the campus visiting professors and research fellows who often

give interdisciplinary courses and seminars. Through the use of the permanent Cornell faculty, the Center is beginning to develop a teaching program, both at the undergraduate and graduate levels, in those areas where it can usefully add to the regular offerings of separate schools and departments.

Please refer to the *Announcements* of the various schools for information about degree requirements and to the *Report and Announcement of the Center for International Studies* at Cornell for information about activities and interdisciplinary and departmental programs.

Courses and seminars offered in 1969-70 will include:

372. PROCESSES OF ECONOMIC GROWTH AND DEVELOPMENT

(Also Economics 372)

Spring term. Credit four hours. T Th S 9:05. Mr. Bickel and guest lecturers.

A consideration of various contributions by economists and others to an understanding of how societies undergo economic growth and institutional change. Developing countries are the main focus of attention, most detailed consideration being given to Africa. Some possibilities of combining elements from economics and other fields to form a broad approach to economic development are explored. This course is identical with Economics 372, but students not majoring in economics will not be held responsible in examinations for technical economic material.

442. POLITICAL AND ECONOMIC CHANGE IN CONTEMPORARY EUROPE

(Also Government 442)

Spring term. Credit four hours. Open to qualified juniors and seniors. M W 2:30-4. Mr. Einaudi.

Emphasis will be placed on the key manifestations of change since the War. The crisis of parties and of social and political institutions. New instruments of public policy. The varieties of public corporations and of planning agencies. The social and technological revolutions and private enterprise. The search for new dimensions of government: regionalism and the supranational communities.

508. SPECIAL PROBLEMS IN ANTHROPOLOGY

(Also Anthropology 508)

Spring term. Credit four hours. Hours to be arranged. Prerequisite, consent of the instructor. Mr. Firth.

Topic to be announced.

542. POLITICAL AND ECONOMIC CHANGE IN CONTEMPORARY EUROPE

(Also Government 542 and Business and Public Administration 634)

Spring term. Credit four hours. Open to graduate students only. Mr. Einaudi.

See Course 442 for description.

550. RESEARCH IN COMPARATIVE MODERNIZATION

Throughout the year. Credit and hours to be arranged. Prerequisite, graduate standing and permission of instructor. Mr. Young.

Students may register who are engaged in research in association with the Comparative Modernization Research Methods Project and who do not wish to register for departmental directed research. The Research Methods Project

staff assists graduate students in the use of available data, such as national social accounts, documents, ethnographic reports and aerial photographs. A variety of informal instruction patterns can be worked out.

[561. IDEOLOGY AND POLITICAL CHANGE]

(Also Business and Public Administration 630 and Government 545)

Spring term. Credit four hours. Hours to be arranged. Mr. Ashford. Not offered in 1969-70.

572. PROCESSES OF ECONOMIC GROWTH AND DEVELOPMENT

(Also Economics 572)

Spring term. Credit four hours. Open to graduate students only. Mr. Bickel and guest lecturers.

See course 372 for description.

635. THE SOCIOLOGY OF AGRARIAN MODERNIZATION AND DEVELOPMENT

(Also Rural Sociology 635)

Fall term. Credit three hours. Open to graduate students only. T Th 10:10. Warren 231. Mr. Weintraub.

This course will be concerned with the macro-social factors affecting agrarian modernization and development. It will focus chiefly on the impact of change and growth on the organization and integration of the rural sector and its interaction with the urban center. In addition, the nature and change of national agrarian policies will be examined.

669. THE INDONESIAN ECONOMY: CHANGE AND GROWTH

(Also Economics 669)

Spring term. Credit four hours. Hours to be arranged. Prerequisite, consent of the instructor. Mr. Arndt.

THE PROGRAM IN GREEK CIVILIZATION

A series of seminars in the Program for Greek Civilization. Open to participants and to other undergraduates by invitation.

GREEK CIVILIZATION 201-202, 203-204 (GREEK LANGUAGE)

Throughout the year. Credit three hours a term. Open by invitation to freshmen and sophomores. Hours to be arranged.

The introduction to ancient Greek is designed to allow for the reading of important works beginning early in the second semester with Plato's *Euthyphro*. In the second year works will sometimes be chosen for simultaneous treatment in the language course, and in translation in another course so that contact with the original will allow a closer and fuller study of its meaning. The works chosen will vary from year to year, but will be drawn from such writers as Homer, Euripides, Plato and Sophocles.

GREEK CIVILIZATION 205-206 (GREEK LITERATURE IN TRANSLATION)

Credit three hours a term. Open by invitation to freshmen and sophomores. Hours to be arranged.

Emphasis will be on the slow reading of a few masterpieces. At the center of the first semester will be Homer's *Iliad* and Aeschylus' *Oresteia*. Aspects

considered will include the representation of human action as a sphere in which divine as well as human agents are operative. Occasional rapid reading will be done to broaden the basis for discussion. The term will end with a study of Sophocles' *Oedipus Tyrannus*. The second semester will concentrate on Euripides and Aristophanes. The relationship between drama and radical thought will serve as introduction to a few of Plato's shorter dialogues.

GREEK CIVILIZATION 207-208 (GREEK HISTORY)

Throughout the year. Credit three hours a term. Open by invitation to freshmen, sophomores, and juniors. Hours to be arranged. Mr. Kagan.

Studies in the nature and development of the *polis* from its origins to its decline. The *polis* will be studied as a unique attempt to achieve a rich and meaningful life for its citizens. The political, constitutional, economic, and social institutions of the *polis* will be examined, and the attempt will be made to establish the relationship between them, the values which underlay them, and the ideas to which they gave rise. Members will read the ancient authors and the interpretations of modern scholars as well.

GREEK CIVILIZATION 210 (GREEK POLITICAL PHILOSOPHY)

Spring term. Credit three hours a term. Open by invitation to freshmen, sophomores and juniors. Hours to be arranged. Mr. Shulsky.

An attempt to understand political alternatives as viewed by the greatest thinkers of antiquity, concentrating on their presentations of human nature, virtue and the best regime. Plato, Aristotle, and Xenophon will be the central authors treated, but there will also be some consideration of historians and poets. Emphasis will be upon careful interpretation of texts.

GREEK CIVILIZATION 211 (CLASSICAL ARCHAEOLOGY)

Fall term. Credit three hours. Open by invitation to freshmen, sophomores and juniors. Hours to be arranged. Miss Milburn.

The material covered will range from approximately 750 B.C. to at least the fourth century; no precise terminal date is set, in order to avoid the limitations imposed by attempting to cover a specific amount of material, and so as to allow the greatest possible freedom for full discussion of problems which particularly interest the class. The course is not designed as a survey; assigned readings will provide the necessary background, while lectures and discussions in class will center on significant questions. The various types of archaeological evidence (architecture, sculpture, vases, coins, inscriptions, the minor arts) will all be examined, and their relationship to contemporary history and literature will be stressed, so as to provide as complete a picture as possible of the civilization of Classical Greece.

GREEK CIVILIZATION 212 (GREEK SCIENCE)

Spring term. Credit three hours. Open by invitation to freshmen, sophomores, and juniors. Hours to be arranged. Mr. Williams.

Science began with the Greeks, Making extensive use of original sources, the students will trace the evolution of science from the early speculations of the Ionians through the mature philosophical systems of Plato and Aristotle, to its fragmentation into specialized sciences in the Hellenistic period. Particular attention will be paid to the kind of questions the Greeks asked of nature and to the metaphysical and mathematical instruments devised by them to find answers.

GREEK CIVILIZATION 214 (GREEK PHILOSOPHY)

Spring term. Credit three hours. Open by invitation to freshmen, sophomores, and juniors. Mr. Sorabji.

LATIN AMERICAN STUDIES

The attention of students interested in Latin American Studies is called to the variety of courses in this field offered in different departments and colleges: Agricultural Economics (Agriculture) 464, 560, 665, 668; Agronomy (Agriculture) 401, 481; Animal Science (Agriculture) 400, 401; Anthropology 418, 432, 433, 502, 517; Child Development and Family Relationships (Home Economics) 442; Economics 325, 565; Government 300, 340, 540; History 319, 320, 488, 687-688; Housing and Design (Home Economics) 545, 546, 547; Industrial and Labor Relations (ILR) 533, 662; Portuguese 101-102, 131-132, 203-204, 303-304, 305-306; Quechua 133-134, 600; Rural Sociology (Agriculture) 420, 516; Sociology 230, 350, 362, 433, 447, 530, 632, 685; Spanish 101-102, 201A, 203-204, 206, 303-304, 311-12, 329, 392, 590, 629.

SEMINAR: LATIN AMERICAN STUDIES 602

Spring term. Credit four hours. Hours to be arranged. Staff.

A required course for all graduate students minoring in Latin American Studies. Students will work on projects in their field of interest under the direction of a faculty member. Various faculty specialists in Latin American affairs will participate in the seminar.

THE SIX-YEAR PH.D. PROGRAM

Limited to forty entering students a year, this program leads to the A.B. degree in three years, the M.A. in four, and the Ph.D. in six. It is designed for superior students who are bound for advanced study in the liberal arts or sciences. All students admitted to it will be given financial aid based on need, renewable for their three undergraduate years (so long as their performance is satisfactory). For each of their three graduate years, provided that they meet graduate school admission standards, they will be awarded fellowships worth \$3000 plus tuition and fees.

AIMS OF THE PROGRAM. The Six-Year Ph.D. Program is intended for the exceptionally able, committed student who is likely to find undergraduate routines confining and the pace of the regular A.B. course too slack. Students of this sort, to avoid the let-down that can follow the transition from school to college, sometimes accelerate on their own power, at the cost either of early, narrow specialization, or of shallow grounding for graduate work. For these students and others, the Six-Year Ph.D. Program balances acceleration with enrichment, providing an integrated course of study with a strong liberal-arts core. By making undergraduate study continuous with study for the graduate degrees, the program also reduces the waste that can follow the unsettling transition to graduate work, and shortens the long, disheartening apprenticeship that graduate life too commonly involves.

THE SEMINARS AND THE ADVISERS. During their three undergraduate years students in the program will be freed of formal requirements. They need not even designate a major. Each student will

be expected to work out, by consultation with his adviser, an individual program of study that suits his needs and leads him into graduate study in his chosen field. All students are expected to take one of the special seminars each year, and three or four other courses each term chosen from the regular college offerings. In the first year this will ordinarily represent a load of sixteen hours a term; in later years, eighteen hours a term.

The seminars are intended to provide a center for the student's general education, and to introduce him to areas in which his special interests may develop. The courses will serve a variety of aims, among them that of giving training in depth in the subjects of students' special interests. The seminars are of different kinds. Some are broad in scope, some rather sharply focused upon special problems. Some are more advanced than others and may require special background, but all are open to any student in the program, at any level. All seminars will demand sustained independent work and clear, accurate writing.

The seminars will be as shown below. Each student in the program will enroll in one seminar, and regular students in the College may also apply for admission, up to the limit of twenty participants.

Group A: Humanities

KO. SEMINAR IN GREEK HISTORY

Throughout the year. Credit four or six hours a term, as arranged. Hours to be arranged. Donald Kagan, Professor of Ancient History. Topic: The *Polis*.

Studies in the nature and development of the *polis* from its origins to its decline. The *polis* will be studied as a unique attempt to achieve a rich and meaningful life for its citizens. The political, constitutional, economic, and social institutions of the *polis* will be examined, and the attempt will be made to establish the relationship between them, the values which underlay them, and the ideas to which they gave rise. Members will read the ancient authors and the interpretations of modern scholars as well.

HO. SEMINARY IN INTELLECTUAL HISTORY

Throughout the year. Credit six hours a term. Hours to be arranged. Cushing Strout, Professor of English, and member, American Studies Committee. Topic: Dimensions of freedom.

An examination of the multiple meanings and problems of freedom in American culture. Selection of texts will emphasize classic themes and spokesmen in a variety of forms: histories, theories, cases, fiction. The issues centering in the ideal of freedom will be topically studied in historical context, and analysis will be made of such different dimensions as free will and determinism, majority rule and minority rights, church and state, individualism and conformity, alienation and community. Texts will include de Tocqueville's *Democracy in America*, Reisman's *The Lonely Crowd*, and *The Federalist*; essays by Edwards, Emerson, Thoreau, and James; novels by Twain, James, Dos Passos, Bellow, and Ellison; and famous cases like the Scopes trial, Sacco-Vanzetti, and the Oppenheimer security hearing.

LO. SEMINAR IN LITERATURE

Spring term. Credit six hours. Hours to be arranged. Arthur Mizener, Old

Dominion Foundation Professor of the Humanities. Topic: The individual and society in twentieth-century English literature.

The crisis of consciousness out of which the great works of twentieth-century literature emerged took the form of a conflict between the needs of the individual and the demands of society. The history of that conflict can be studied in representative writers in almost any literature of western Europe. This seminar will concern itself with the history of that conflict in Anglo-American literature from the breakdown of the Victorian compromise to the present. It will concentrate on the following texts: Kingsley Amis, *Take a Girl Like You*; H. G. Wells, *Experiment in Autobiography*; Joseph Conrad, *Heart of Darkness*; Henry James, *The Wings of the Dove*; *Decline of the West*; Pound's *Mauberley*, *Selected Cantos*; Eliot's *The Waste Land*; Yeats, selected lyrics; *The Coming Struggle for Power*; Fitzgerald's *The Great Gatsby*; Dos Passos' *The Big Money*; Robert Penn Warren, *All the King's Men*.

SO. SEMINAR IN GREEK SCIENCE

Throughout the year. Credit four or six hours a term as arranged. Hours to be arranged. L. Pearce Williams, Professor of History. Topic: An examination of the philosophical, mathematical, and experimental elements of the physical and natural sciences in Greek antiquity.

The purpose of this seminar is to examine the ways in which the Greeks looked at nature. Special attention will be paid to the kinds of questions which they thought worth asking of nature, the kinds of explanations they thought adequate and satisfying, and the overall function of science within the broad framework of Greek society.

TO. SEMINAR IN CLASSICAL GREEK ARCHAEOLOGY

Fall term. Credit four or six hours as arranged. Hours to be arranged. Elizabeth Milburn, Assistant Professor of Classics. Topic: A study of the various types of archaeological evidence, and their relationship to contemporary history and literature, from the eighth to the fourth century B.C.

The material covered will range from approximately 750 B.C. to at least the fourth century; no precise terminal date is set, in order to avoid the limitations imposed by attempting to cover a specific amount of material, and so as to allow the greatest possible freedom for full discussion of problems which particularly interest the class. The course is not designed as a survey; assigned readings will provide the necessary background, while lectures and discussions in class will center on significant questions. The various types of archaeological evidence (architecture, sculpture, vases, coins, inscriptions, the minor arts) will all be examined, and their relationship to contemporary history and literature will be stressed, so as to provide as complete a picture as possible of the civilization of Classical Greece.

UO. SEMINAR IN GREEK LITERATURE

Fall term. Credit four or six hours as arranged. Gordon Kirkwood, Professor of Classics. Topic: Forms of thought and poetic expression to 400 B.C.

The Homeric epic, the lyric poetry of the archaic age, and the tragic drama of the fifth century mark three important and significantly different stages in the history of Greek culture. The seminar will study a number of interrelated aspects of the literature of these periods: changing forms of poetry in relation to the social background; concepts of poetic structure, unity, and function; the relationship between divine and human will and action; the development of moral and social concepts and values. The principal works read (in translation) will be: the *Iliad*, the *Odyssey*, Hesiod's *Theogony*, selected poems of Archilochus, Sappho, Alcaeus, Theognis, and Pindar;

Aeschylus' *Seven against Thebes* and *Oresteia*; Sophocles' *Antigone*, *Oedipus Tyrannus*, and *Oedipus at Colonus*; Euripides' *Medea*, *Hecuba*, *Trojan Women*, and *Bacchae*.

Group B: Science and Mathematics

MO. SEMINAR IN ASTRONOMY

Fall term. Credit six hours. Hours to be arranged. Carl Sagan, Associate Professor of Astronomy. Topic: The astronomical perspective.

A discussion of the comparative position of the earth and its inhabitants in the universe. Material will be drawn from astronomy, physics, and biology. Main emphasis will be placed on planetary motions, the scale of the universe, stellar evolution, the origin of the solar system and of life, and the prospects for extraterrestrial intelligence.

XO. SEMINAR IN ASTRONOMY

Spring term. Credit six hours. Hours to be arranged. Carl Sagan, Associate Professor of Astronomy. Topic: Planetary Astronomy.

A modern discussion of the atmospheres, surfaces, and interiors of the planets, with emphasis on Venus, and, particularly, Mars. Attention will also be paid to such historical controversies as the Martian canal problem. In studies of impact cratering, students will deal with Lunar Orbiter and Mariner 4 photos. Consideration of the social and philosophical implications of planetary exploration will be encouraged.

NO. SEMINAR IN CHEMISTRY AND BIOLOGY

Spring term. Credit six hours. Hours to be arranged. Roald Hoffmann, Associate Professor of Chemistry. Topic: The architecture and dynamics of molecules, both natural and unnatural.

An infinite variety of three-dimensional shape characterizes the structure of molecules, and with each geometrical arrangement there is associated a specific set of chemical reactions. The shapes of molecules, the methods of structure determination, the mechanisms of chemical transformation and the synthesis of both natural and unnatural molecules will be discussed. The goal is to work up to an understanding of the structure and function of biological systems at a molecular level.

GO. SEMINAR IN THE DEVELOPMENT OF MATHEMATICS

Either term. Credit six hours. Hours to be arranged. Peter Hilton, Professor of Mathematics. Topic: The art and science of mathematics.

The objective will be to present basic notions of mathematics within the framework of a study of the development of mathematics. The following topics will receive attention: differential and integral calculus; elementary number theory; group theory; foundations of geometry; linear algebra; elementary theory of differential equations. The approach will be designed to show why the fundamental concepts of mathematics arise and why they survive; this will bring out the criteria of generality and applicability but will not preclude the acquisition by those attending the seminar of good and efficient technique. Suggested readings: Courant and Robbins, *What is Mathematics?*; Klein, *Elementary Mathematics from the Advanced Standpoint*; Davenport, *The Higher Arithmetic*; Hardy, *A Mathematician's Apology*; Birkhoff and MacLane, *Survey of Modern Algebra*.

DO. SEMINAR IN PHYSICAL SCIENCE

Fall term. Credit six hours. Hours to be arranged. David Mermin, Associate Professor of Physics. Topic: Relativity.

Before 1905 physicists found the question "What is time?" as baffling as anybody else did. Since 1905 and the advent of the special theory of relativity they have continued to be baffled, but in the knowledge that the source of their bafflement is far richer and more intricate than they had imagined. This seminar is for nonscientists who find time intriguing and geometry not intolerable. The special relativistic theory of space and time will be examined in an elementary but complete and honest way. The aim will be to convey a working understanding of the inseparability of space and time, and the extraordinary doings of moving clocks and measuring rods.

Group C: Social Sciences**AO. SEMINAR IN ANTHROPOLOGY**

Throughout the year. Credit six hours a term. Hours to be arranged. Topic: to be announced.

[PO. SEMINAR IN ECONOMIC HISTORY]

Fall term. Credit six hours. Hours to be arranged. Douglas F. Dowd, Professor of Economics. Topic: The seventeenth-century. Not offered in 1969-70.

The seventeenth century will be approached as a period of great turbulence and social change, resulting from combinations of strong elements of continuity and of innovation, and resulting in marked tendencies toward destructive as well as constructive developments. The seminar will attempt to identify, to relate to each other, and to explain these processes (probably with an emphasis on England and France, but not necessarily to the exclusion of other regions) in their various economic, political, cultural, religious, scientific, and military manifestations, as the abilities and inclinations of the seminar members suggest.

QO. SEMINAR IN ECONOMIC HISTORY

Spring term. Credit six hours. Hours to be arranged. Douglas F. Dowd, Professor of Economics. Topic: The United States today.

The approach in this seminar will be quite similar to that noted above for the seventeenth-century, with modifications appropriate to the changed time and place, and with the further modification that participants will severally and individually spend the semester, in discussion and in research papers, attempting to answer an important and relevant question about the contemporary American scene.

IO. SEMINAR IN PSYCHOLOGY

Throughout the year. Credit six hours a term. Hours to be arranged. Robert B. MacLeod, Susan Linn Sage Professor of Psychology. Topic: Conceptions of human nature.

Reading and discussion will center about the major attempts to identify and explain what is distinctively human about man. While the emphasis will be on psychological theory, classical as well as contemporary, a good deal of attention will be paid to problems of current research interest. In the first term the psychological basis of cognition will be the topic: perception, memory, imagination, thinking; in the second term, the psychological basis of conduct: motivation, emotion, personality, social behavior. Students will

be expected to present short reports on special topics and to prepare a longer term paper on a more general topic of their own choosing. While the two seminars constitute a sequence, students may with permission take the second without having had the first.

VO. SEMINAR IN SOCIAL HISTORY AND POLICY

Fall term. Credit six hours. Hours to be arranged. Milton R. Konvitz, Professor of Industrial and Labor Relations and Professor of Law. Topic: Poverty.

The seminar will begin with an analysis of the definition, nature, and extent of poverty in contemporary American society. Seminar meetings will then probe into special aspects of poverty in the history of Western civilization, with some comparative considerations of poverty in other civilizations, especially India and Latin America. The range of interests may be indicated by some of the topics which may be discussed: the treatment of poverty in the Hebrew Scriptures; in the New Testament; in primitive Christianity; in medieval Christendom; in ancient Greece and Rome; by St. Francis of Assisi; in the Elizabethan Poor Laws; in Puritanism; by Luther; by Calvin; by the Wesleys and Methodism; by Tolstoy; by Thomas Carlyle; by John Ruskin; in the American Gospel of Wealth; by the Social Darwinians; by Dickens and other British and by some selected American novelists; by the American transcendentalists, especially Emerson and Thoreau; by Marx and Engels.

WO. SEMINAR ON POLITICAL PHILOSOPHY

Spring term. Credit six hours. Hours to be arranged. Abram Shulsky, Visiting Assistant Professor of Government. Topic: to be announced.

The director of each seminar will serve as adviser to ten or twelve students in the program, consulting with them, helping them to select courses, and guiding them ultimately in their choices of a field and a director for their graduate work.

SOCIETY FOR THE HUMANITIES

Mr. Max Black, Director. Fellows (1969-70): Messrs. A. W. H. Adkins, Herbert Butterfield, J. E. Chamberlin, Herbert Dieckmann, Winfried Kudszus, Georges Poulet, Robert Starobin.

The Society awards fellowships for research in the humanities in three categories: Senior Visiting Fellowships, Faculty Fellowships, Post-doctoral Fellowships. The fellows offer, as adjuncts to their research, informal seminars intended to be off the beaten track. Detailed information about these seminars is circulated to interested departments.

Membership in the Society's seminars is open, by invitation, to suitably qualified undergraduates and graduate students. Credit can be earned at the discretion of the College, but no examinations or other formal exercises are required and the only grade given is S. All seminars are held in the Society's house at 308 Wait Avenue. Admittance is permitted only to those officially enrolled or specifically invited to attend as visitors.

Students wishing to attend any of these seminars should write to the Secretary of the Society at 308 Wait Avenue (campus mail) giving their names, addresses, telephone numbers, and brief summaries of their qualifications.

Seminars offered in 1969-70 will include:

409-410. SEMINAR ON AMERICAN BLACK HISTORY

Throughout the year. Credit four hours a term. M 1:45-3:30. Open, by invitation, to seniors and graduate students. Mr. Starobin.

A study of the significance of black people in America from the slave trade period to the present day. The African background of American Blacks, the importance of the slave trade, the growth of the institution of slavery, black resistance to bondage, the role of Blacks during the American Civil War and Reconstruction, the origins of segregation, the survival and rebirth of African cultural forms, and the nature of various protest and nationalist movements in the twentieth century.

411-412. SEMINAR ON MODERN LYRICAL POETRY

Throughout the year. Credit four hours a term. T 1:45-3:30. Open, by invitation, to seniors and graduate students. Mr. Kudzus.

A study of language processes typical for modern lyric poetry. The seminar will focus on the later works of Hölderlin, Nietzsche, and Trakl. Approaches from disciplines other than literary criticism—philosophy, psychology—will be considered.

A thorough knowledge of German is desirable.

413-414. SEMINAR ON RELATIONS BETWEEN MODERN ART AND LITERATURE

Throughout the year. Credit four hours a term. W 1:45-3:30. Open by invitation, to juniors, seniors, and graduate students. Mr. Chamberlin.

An examination of the analogies and affiliations between the plastic and the written arts of this century. The seminar should interest students in philosophy, modern history, fine arts, and literature. Materials will be taken from aesthetics, art history, art, and literature.

415-416. SEMINAR ON SOME BASIC QUESTIONS IN GREEK ETHICS FROM SOCRATES TO ARISTOTLE

Throughout the year. Credit four hours a term. W 3:45-5:30. Open, by invitation, to juniors, seniors, and graduate students. Mr. Adkins.

A study of Greek philosophical ethics, as represented by Socrates, Plato, and Aristotle, against the background of nonphilosophical Greek attitudes and beliefs. An attempt will be made to indicate why these thinkers have different ethical presuppositions and ask different ethical questions from those which have seemed appropriate to more recent moral philosophers. Emphasis will be on careful interpretation of selected texts.

505-506. SEMINAR ON TEXTUAL CRITICISM AND LITERARY INTERPRETATION

Throughout the year. Credit four hours a term. M 3:45-5:30. Open, by invitation, to seniors and graduate students. Mr. Dieckmann.

A study of the various stages in the composition of a literary work as a means of understanding its structure and meaning. Variants, revisions, and elaborations in the manuscript or in the printed version will be analyzed and evaluated. The works will be selected predominantly from French literature of the eighteenth century.

509. SEMINAR ON THE HISTORY OF HISTORIOGRAPHY

Fall term. Credit four hours. Th 3:45-5:30. Open, by invitation, to seniors and graduate students. Mr. Butterfield.

The origins. The biblical contribution. The ancient Greeks. The Christian

developments. The Renaissance. The development of historical criticism. The rise of different sorts of history (e.g., economic history). The evolution of "universal history."

603. SEMINAR ON CONTEMPORARY FRENCH CRITICISM

Fall term. Credit four hours. T 3:45-5:30. Open, by invitation, to seniors, graduate students, and faculty. Mr. Poulet.

The seminar will be devoted to the great French critics of the twentieth century. First the precursors: Mme. de Stael, Sainte-Beuve. Then the critics of the *Nouvelle Revue Française*: Thibaudet, Riviere, Du Bos, Fernandez. Then, the critics of the Geneva school: Raymond, Beguin, Rousset, Starobinski; Bachelard, Blanchot, and Jean-Pierre Richard. Finally, the advent of structuralism.

The aim will be to reveal principles common to these many writers. The seminar will also investigate affinities and antagonisms between this "new criticism" in France and the "new American criticism."

Lectures in French, with free discussion in English or French.

THE COLLEGE SCHOLAR PROGRAM

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398-399. INDEPENDENT STUDY

Throughout the year. Credit two hours a term. Primarily for upperclassmen. Prerequisite, consent of the adviser. Hours and instructor to be arranged.

498-499. INDEPENDENT STUDY

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1969-70

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