

CORNELL UNIVERSITY through its six-week Summer Session offers unusual opportunities for study at the graduate and undergraduate levels. Instruction is provided mainly by the faculties of the Graduate School; the Colleges of Arts and Sciences, Engineering, Agriculture, and Home Economics; the Schools of Education and Industrial and Labor Relations; and the Department of Hotel Administration. The facilities of the University are available to Summer Session students: libraries, classrooms, and laboratories, residence halls, dining rooms, and cafeterias; health and infirmary services; student union, playing fields, and recreational areas.

Programs and courses of instruction are planned with several groups in mind. Undergraduates may choose from a wide selection of courses in the humanities, history and the social sciences, and the natural sciences. Advanced courses, supplemented by seminars and informal study, also are offered in most fields. Workshops, seminars, and professional courses have been planned to meet the needs of teachers, supervisors, and administrators. Special courses and unit programs are offered for workers in particular professions.

VETERANS IN THE SUMMER SESSION...Veterans eligible for benefits under the G.I. Bill (Public Law 346, as amended December 28, 1945) may use those benefits for Summer Session work. Eligibility should be established well in advance of registration day. Upon presentation of a certificate of eligibility and entitlement or terminal leave order at registration time, tuition, fees, books, and supplies will be charged to the Veterans Administration, up to the maximum allowed by the law, which is about \$88.

Veterans who have not established eligibility at the time of registration may be required to pay tuition, and fees, and charges for required books and supplies. These payments will then be refunded to them when their certificates of eligibility and entitlement are filed. Representatives of the Veterans Administration at the University will help veterans who have not established their eligibility to make the necessary applications. Original discharge papers or certified copies of them, and, in the case of married veterans, legal proof of marriage, must be furnished at the time of making application.

Veterans eligible for vocational rehabilitation training under Public Law 16 should arrange in advance for the transfer of their cases to the Syracuse, N. Y., office of the Veterans Administration. On arrival they should report at once to the Training Officer who will advise them on further procedure.

Veterans who hold New York State War Veterans Scholarships and Canadian Veterans eligible for education benefits under P.C. 5210 should present evidence of their eligibility at registration time.

All veterans who wish to use educational benefits from any of these sources must register in the University Office of Veterans Education on registration day, or as soon as possible after that date. Late registrants run some risk of receiving only partial benefits.

ADMISSION

Application for admission to the Summer Session of 1947 must be made on the special form mailed by the Director of the Summer Session on request. In most cases the information called for on this form will be sufficient. Junior standing or above is required of undergraduates registered in institutions other than Cornell University. In addition, they will be required to submit evidence of good standing and approved programs of study before they are admitted. Applications should be filed as early as possible, and late applicants who are admitted may unavoidably be delayed in registration. The Director reserves the right to close admissions to undergraduate students who apply after June 1 if facilities are taxed. *A certificate of admission signed by the Director is a prerequisite for registration in the Summer Session.*

The work of the Summer Session is planned to place the facilities of the University at the disposal of those persons who can use them to good advantage and for serious purposes during the summer period. Admission, however, cannot be granted to persons inadequately trained for the work they propose, or whose records in Cornell University or elsewhere are unsatisfactory; neither will admission be granted to persons whose purposes seem inadequate or inappropriate or better served by other work at other institutions.

Admission of undergraduate or graduate students to Summer Session study establishes no priority with respect to admission to the regular terms under the quotas now in effect. Students seeking admission to an undergraduate college in the fall should apply to the Director of Admissions. Admission to the Graduate School is handled by the Dean of the Graduate School.

ADMISSION TO THE GRADUATE SCHOOL... A student planning to become a candidate for an advanced degree from Cornell

University must also apply for admission to the Graduate School. For this, two requirements are made: (1) the applicant must have received a baccalaureate degree from a college or university of recognized standing, or must have done work equivalent to that required for such a degree; (2) as judged by his scholastic record, or otherwise, the applicant must show promise of ability to pursue advanced study and research.

A student who wishes to enter the Graduate School should file application for admission, together with all the required supporting credentials, in the Office of the Dean of the Graduate School by June 1 if possible and not later than June 20. Application must be made on the formal blanks obtainable from the office of the Graduate School, and must be accompanied by complete and official transcripts of the student's previous training.

Because of the time required to secure and evaluate transcripts and other records, a period of two to four weeks usually elapses between the receipt of an application and formal action upon it. Every effort will be made to render decisions promptly, and applicants can assist materially by making early applications.

Students planning to apply for admission to the Graduate School should read the section on the Graduate School beginning on page 9. Further information is given in the Announcement of the Graduate School, which will be sent by the Dean of the Graduate School upon request.

REGISTRATION

Registration for the Session of 1947 will take place on Tuesday, July 1, in Barton Hall; the hours for registration will be from 8:30 to 12:30 p.m. and from 1:30 p.m. to 4 p.m. Students are urged to register on this day. Advance registration, either in person or by mail, cannot be arranged.

Registration is required for admission to any of the exercises of the Summer Session. In addition, all students must register with the Counselors of Students. Registration of automobiles to be driven in and about Ithaca by Summer Session students is also required.

REGISTRATION IN THE GRADUATE SCHOOL. . . . Students who wish to obtain credit toward the advanced degrees of Cornell University for Summer Session work must arrange for admission to the Graduate School by correspondence in advance. They will then, on registration day, register in the Graduate School. Students whose applications and credentials for admission to the Graduate School are received after June 7 but before June 20 may not be able to register in the Graduate School on registration day, July 1. They may register in the Summer Session on that day and, after consulting members of

the faculty in their proposed fields of graduate study, begin at once their programs of work. They will register in the Graduate School in Morrill Hall immediately after receiving notice of favorable action on their applications.

GRADUATES NOT REGISTERING IN THE GRADUATE SCHOOL....Students registered in the Graduate Schools of other institutions and planning to obtain credit toward the advanced degrees from those institutions by their Summer Session work do not register in the Graduate School. Before registering in the Summer Session they should arrange for the crediting of their Summer Session work by the institutions from which they plan to take the degrees. Other students who hold bachelors' degrees but are not candidates for advanced degrees also register in the Summer Session only.

PROGRAM OF STUDY....The normal Summer Session program is six semester hours and students are advised against registering for more. In exceptional cases a student may enroll for eight semester hours with special permission of the Director.

Undergraduates are required to register for a program of six semester hours unless the Director grants permission for a lighter program. A program of study must have advance approval of the student's college, either in Cornell or elsewhere. An alternative must be named for any course requiring the approval of the instructor or the instructor's approval must be written on the admission form. Changes of program found to be necessary at the time of registration must be reported to the Director and can not be made without the approval of an officer of the institution in which the student is a candidate for a degree.

Graduates are required to register for at least four semester hours of course work except by permission of the Director. The program of a Summer Session student who is also enrolled in the Graduate School of Cornell University must have the approval of his special committee. For courses requiring permission of the instructor, such permission must be secured on registration day.

REGISTRATION FOR ATTENDANCE....Under certain circumstances teachers and other mature students, not candidates for degrees, may receive permission to register for some or all of their courses for attendance only. Approval of the Director and instructors concerned must be obtained. Students so registered are required to attend regularly and to perform the class work of the courses, but they will not be permitted to take the final examinations. They will receive no credit for these courses but may secure certificates of attendance in courses so registered for.

AUDITORS....Admission to classrooms during the Summer Session is restricted to students registered for the Session. A student thus duly

registered may occasionally visit any class; but if he wishes to attend regularly classes for which he is not registered, he must secure an auditor's permit. Such permits will be granted whenever the student can show a serious purpose in such attendance. Auditors are not required to take part in the work of the courses which they visit, and certificates of attendance cannot be issued to them. Auditor's permits cannot be issued on registration day; they may be secured on Wednesday, July 2, and later; at the Summer Session office.

LATE REGISTRATION . . . Students reaching Ithaca on July 2 or later will register at the following times and places: all students, at the office of the Summer Session, between 9 a.m. and 4 p.m.; graduate students, also with the Dean of the Graduate School at his office in Morrill Hall, at the same hours; all women students, also with the Counselor of Students, Administration Building, between 9 a.m. and 4 p.m.; owners and drivers of automobiles, also with the Campus Patrol Office, between 8:30 a.m. and 4:30 p.m.

CHANGES IN REGISTRATION . . . Changes in registration include cancellation of a course, change from one course to another, change of credit status, change from credit to attendance, and addition of a course to the program. All changes of registration after Tuesday, July 1, must be made in the Summer Session office, 245 Goldwin Smith Hall. Except by permission of the Director, no changes of registration may be made after Friday, July 4. When a change of registration involves enrollment in another course, approval of the instructor of the new course must be obtained.

An undergraduate enrolled in an institution other than Cornell must obtain the approval of the appropriate officer in his institution for *any* change made in his program.

WITHDRAWAL FROM THE SUMMER SESSION . . . A student may arrange for withdrawal at any time by cancelling his registration at the Summer Session office, 245 Goldwin Smith Hall. In such cases, the Treasurer may refund a part of the tuition fee or cancel a part of the obligation that the student has incurred for tuition, provided the reason for the withdrawal is stated in writing and is satisfactory to the Treasurer and the Registrar. In such cases the student is required to pay twenty per cent of the term's tuition for each week or fraction of a week between the first registration day and the date of his certificate of withdrawal, unless the withdrawal is made before noon on Friday, July 4.

FEES

All fees are due and payable at the Treasurer's office in Morrill Hall on registration day, July 1. The last day for payment of fees without penalty is Monday, July 7.

TUITION FEES. . . The tuition fee for the Summer Session is \$60. Students taking unit courses for less than six weeks will pay tuition at the rate of \$12 a week. If unit courses extending through six weeks are taken, the tuition fee will be \$60. Special fees are charged for individual instruction in music, tennis, and other subjects.

MATRICULATION FEE. . . A matriculation fee of \$11 and a chest radiograph fee of \$2.00 are charged if the student is registering for the first time in the Graduate School of Cornell University, unless the student, as an undergraduate in Cornell University, has already paid this fee. A student registering in the Summer Session but not in the Graduate School does not pay this fee unless he is at the same time registering for the first time as a candidate for a degree from one of the other Schools or Colleges of the University. For further information about this fee, the *General Information* number, which may be obtained from Cornell University Official Publication, 124 Roberts Place, upon request, should be consulted.

OTHER FEES AND DEPOSITS. . . All Summer Session students will also pay a health service and infirmary fee of \$5. The services furnished for this fee are described on page 16.

Laboratory, shop, field-trip, and incidental fees are charged for materials used and for other expenses in certain courses. The amounts of these fees are specified in the descriptions of the courses in which they are charged.

Deposits refundable upon return of apparatus, etc., are required in certain courses. The amounts of these deposits are specified in the descriptions of the courses in which they are charged.

A fee of 10 cents a period is charged for the use of the University swimming pool in Beebe Lake, adjacent to the campus.

OTHER REGULATIONS CONCERNING FEES. . . Any student, graduate or undergraduate, except as hereinafter provided, who fails to pay his tuition, fees, and other indebtedness, or, if entitled to free tuition fails to claim the same at the Treasurer's office and pay his fees within the time prescribed by the University, is thereby dropped from the University. When in his judgment the circumstances in a particular case so warrant, the Treasurer may allow an extension of time to complete payments. For such extension, the student will be assessed a fee of \$2. A reinstatement fee of \$5 will be assessed in the case of any student who is permitted to continue or return to classes after being dropped from the University for default in payments. For reasons satisfactory to the Treasurer and the Registrar, which must be presented in writing, the above assessment may be waived in any individual case.

Any tuition fee or other fee may be changed by the Trustees to take effect at any time without previous notice.

ACADEMIC CREDIT

All courses offered in the Summer Session, except some of the unit courses of one or two weeks in length, are accepted for credit in one or more of the Schools and Colleges of the University, when taken by matriculated students in these Schools and Colleges. No student may receive credit for more than eight semester hours for work done in a single Summer Session.

UNDERGRADUATE AND GRADUATE COURSES. . . . There is, in general, no sharp distinction at Cornell University between undergraduate and graduate courses. In this announcement each course is marked immediately after the title in one of three ways:

Undergraduate. These courses are intended primarily for undergraduates. Students registered in the Graduate School of Cornell University will not receive credit for these courses toward an advanced degree unless such credit is specifically recommended by the special committee in charge of their work.

Graduate. These courses are intended primarily for students who are candidates for advanced degrees, and for teachers and others who wish certification to accrediting agencies for work done at the graduate level. Undergraduates with adequate preparation may register for these courses only after receiving permission from the instructors in charge.

Undergraduate and graduate. These courses are open to graduates and advanced undergraduates. Graduates registering for these courses who are candidates for advanced degrees or who wish certification to accrediting agencies for work done at the graduate level must indicate on their registration blanks their intention to complete the course at the graduate level and must be prepared to do any additional work that may be required. Such students are advised to check with their instructors early in the course to see that the level is properly recorded.

COLLEGE OF ARTS AND SCIENCES. . . . To obtain credit towards the Bachelor of Arts degree for work done in a Cornell Summer Session, a student must previously have filed with the University Director of Admissions credentials covering the entrance requirements of the College of Arts and Sciences. He should then, in advance of Summer Session registration, secure the Dean's approval of his selection of courses. The academic requirements for the degree of Bachelor of Arts are explained in detail in the *Announcement of the College of Arts and Sciences*.

The Summer Session records of students registered in the College of Arts and Sciences are reviewed by the usual standing committees of the College, and poor records in the Summer Session are liable to bring the same penalties as in the regular University session.

COLLEGE OF ENGINEERING . . . Students in the College of Engineering who desire to offer work done in the Summer Session toward requirements for graduation should consult the Director of the School in which they are regularly registered before registering in the Summer Session. Students not yet matriculated in the College of Engineering, but planning to enter it, may obtain information about its requirements by applying to the Dean of the College of Engineering.

STATE COLLEGE OF AGRICULTURE . . . Students in the State College of Agriculture must consult with Dr. J. P. Hertel, Secretary of the College, and must obtain his approval of the proposed program of courses if credit in that College is to be secured.

DEPARTMENT OF HOTEL ADMINISTRATION . . . Students in the Department of Hotel Administration who desire to offer work done in the Summer Session towards requirements for graduation should consult Professor Meek of that department before registering in the Summer Session.

INSTITUTIONS OTHER THAN CORNELL UNIVERSITY . . . The foregoing regulations apply to undergraduate students matriculated at Cornell University. Undergraduates enrolled in other institutions, before admission to the Summer Session, will submit a program of courses approved for credit by an officer of the institution in which they are candidates for a degree. On registration day they will register for the courses of this program, and changes may be made only by permission of the Director. At the end of the Session, an official transcript of the Summer Session record of each undergraduate student will be sent to the institution in which that student is registered as a candidate for a degree. The Cornell Summer Session can assume no responsibility for the use to be made of credits earned by students coming from other institutions. The transcripts mentioned above will show what courses have been taken, the amount of credit in semester hours, and the grades.

CERTIFICATE OF SUMMER RECORD . . . At the close of the Session transcripts of the records of all undergraduates enrolled in other institutions will be sent to the registrars of those institutions. Other Summer Session students may receive certificates of attendance or of work performed, with grades, upon request. Application for certificates should be made at least three days before the end of the Session, and the applicant must leave at the office of the Registrar a large-sized envelope stamped and directed to his home address. The certificate will then be forwarded by mail.

All grades are reported on a numerical scale from 0 to 100. If a student is absent for reasons satisfactory to the instructor, the instructor may record the grade "Inc." together with a numerical grade for work

done. It is impossible to change the grade of "Inc." after Friday, August 1, 1947. The colleges of Cornell University regard the grade of 60 as the lowest passing grade.

THE GRADUATE SCHOOL

APPLICATION FOR ADMISSION. . . . A student planning to apply for admission to the Graduate School should write at once to the Dean of the Graduate School for a copy of the Announcement of that School and for the blanks required for applications for admission. The Announcement gives full information about the advanced degrees granted by Cornell University, including the language requirements for admission and for some of the advanced degrees; residence and course requirements; and other information not given in the following sections.

Applications for admission to the Graduate School should be filed by June 1 if possible and not later than June 20. After admission to candidacy for a degree, the student may write in advance of the opening of the Session to professors whose courses he plans to take. In this way it is possible to secure advice with regard to major and minor subjects, or fields of concentration, and information about course requirements in specific fields, and to avoid delay and interruption of work at the opening of the Session.

REQUIREMENTS FOR MASTERS' DEGREES. . . . The requirements for the degrees Master of Arts, Master of Science, and Master of Science in Agriculture consist of three parts: (1) a minimum period of residence; (2) completion of such courses and other work (under Plan A, including a thesis) as may be specified by a special committee selected by the student to direct his work; (3) competence in scholarship, tested by a final comprehensive examination.

RESIDENCE REQUIREMENTS. . . . The minimum residence requirement for the Masters' degrees mentioned above is two semesters of residence at Cornell University. This minimum requirement may be satisfied by five Summer Sessions of six weeks, at Cornell University. With some restrictions, residence credit to the amount of one Summer Session will be allowed for a succession of unit courses of two or three weeks in length taken in different summers. Candidates for these degrees who are in residence during Summer Sessions are also expected to continue their studies during the year under the direction of the chairman of the special committee in charge of their work.

SUBJECT MATTER REQUIREMENTS. . . . The subject matter requirements for the Masters' degrees mentioned above may be satisfied in two ways. Each student, when applying for admission to candidacy

for a Master's degree, should indicate which of these two plans of work he wishes to follow:

PLAN A. . . . The candidate selecting this plan chooses a major subject of rather limited scope (e.g., French Literature, American History, Botany, Physical Chemistry) to which he plans to devote the greater part of his time. He also selects a minor subject properly related to the major subject. He then selects from the faculty of the Graduate School a member to represent each of his subjects; these constitute his special committee, and the representative of the major subject acts as chairman. The candidate then files with the Dean of the Graduate School a statement of his major and minor subjects approved by the members of his special committee. This statement must be filed within one week after registration.

The candidate then and from time to time thereafter confers with the members of his special committee, and with their help outlines a program of work which meets the requirements for the degree he expects to earn. These requirements will include achievement in independent investigation supported by a thesis acceptable to the student's special committee. In addition to course examinations, the candidate is required to pass a final examination comprehending the thesis and the major and minor subjects.

PLAN B. . . . The candidate selecting this plan chooses a field of concentration of broader scope (e.g., Biological Sciences, Social Studies, English, Foreign Languages, Home Economics), to which he plans to devote at least half of his time. He also selects a group of subjects within which he plans to distribute the remainder of his work. He then selects two members of the faculty to serve as his special committee. One of these, who is chairman of the committee, represents the field of concentration; the other may be chosen from either that field or some related field, depending on the candidate's program. The candidate then files with the Dean of the Graduate School a statement of his field of concentration approved by the members of his special committee. This statement must be filed within one week after registration. The candidate then and from time to time thereafter confers with his special committee, and with their help outlines a program of work which meets the requirements for the degree he expects to earn.

The subject matter requirements under this plan include the satisfactory completion of approved studies carrying a minimum of thirty semester hours of credit, of which approximately one half will be in the field of concentration and the rest will be variously distributed with the sanction of his special committee. Work acceptable within the field of concentration must be devoted in substantial part to studies requiring original investigation, organization, and criticism on the part of the student. The candidate is not required to present a formal thesis;

but if he does not do so, he is required to complete an expository or critical essay, or a problem in research, to the satisfaction of his special committee. In addition to course examinations, the candidate is required to pass a final examination comprehending the field of concentration and the distributed studies.

REQUIREMENTS FOR THE DOCTOR'S DEGREE... The requirements for the Doctor's degree include a reading knowledge of French and German, or two other foreign languages approved by the student's committee and tested by a special examination. A major subject and two minor subjects are chosen and a thesis is always required. The residence requirement for the Doctor's degree may, upon recommendation of the student's special committee, be fulfilled in part by attendance during the Summer Session. For this purpose, three six-week Summer Sessions will be regarded as the equivalent of one term, and five six-week Summer Sessions as the equivalent of one year. Ordinarily, residence credit for work done in Summer Sessions is limited to two terms.

Candidates for the Doctor's degree should in all cases consult the *Announcement of the Graduate School* for a more complete statement of the requirements.

COMPLETION OF REQUIREMENTS... Candidates for advanced degrees who expect to complete requirements and to take their final examinations at the end of a Summer Session should call at the office of the Graduate School not later than the third week of the Session for the necessary instructions and blanks.

REGISTRATION FOR RESIDENCE CREDIT... To obtain residence credit in the Graduate School for Summer Session work the student must register both in the Summer Session and in the Graduate School; and such registration must be completed within the first week of the Session.

CANDIDATES IN THE SCHOOL OF EDUCATION... The School of Education in its administration of graduate work functions as a division of the Graduate School of the University with the same requirements for admission except as to foreign languages. Two professional degrees are offered. (1) The degree of Master of Education (M.Ed.) is intended primarily for those who complete, through a newly-established five-year program, the pre-service requirements for admission to teaching. (2) The degree of Master of Science in Education (M.S. in Ed.) is intended primarily for those who already hold certificates to teach but who wish to prepare themselves for some specialized form of educational service, such as administration, supervision, or guidance. In general, the program does not demand the extensive research re-

quired of a candidate under Plan A of the regular Master's degree and permits a broader selection of courses. For further information regarding the requirements for these degrees, consult the *Announcement of the School of Education*, which will be sent upon request.

NON-CANDIDATES. . . . A student admitted to the Graduate School as a non-candidate selects an adviser to direct his work. He then files with the Dean of the Graduate School not later than one week after registration a statement, approved by his adviser, of the studies he plans to pursue.

RESIDENT DOCTORS. . . . Persons who hold a Doctor's degree or have equivalent standing may, subject to permission from the Dean of the Graduate School, register as resident doctors to carry on advanced work in their special fields of study. Upon recommendation of the Dean of the Graduate School resident doctors are exempt from the payment of tuition and all other fees except the laboratory fees. Ordinarily, resident doctors may not attend courses.

SPECIAL REGULATIONS

CONDUCT AND SCHOLARSHIP. . . . The Summer Session is conducted under the general regulations governing conduct and scholarship which apply to all sessions of the University. Students are expected to familiarize themselves with dormitory and other rules and to abide by them.

The University rules governing student conduct are:

"A student is expected to show both within and without the University unflinching respect for order, morality, personal honor, and the rights of others. The authority to administer this rule and to impose penalties for its violation is vested in the University Committee on Student Conduct. The rule is construed as applicable at all times, in all places, to all students of the University."

"A student may at any time be removed from the University if, in the opinion of the Committee on Student Conduct, his presence is not conducive to the University's best interests."

The officers of the University also reserve the right to cancel the registration of any student at any time for neglect of scholastic duties.

AUTOMOBILE REGULATIONS. . . . Because of local traffic and parking conditions it is necessary to require registration of both motor vehicles and their drivers during the Summer Session as well as during the academic year. Each student who maintains or operates a motor driven vehicle in or about Ithaca during the Summer Session must do the following: (1) register with the Campus Patrol Office, Old Armory, at the time of University registration, by paying a fee of \$1 and displaying, as directed, a registration sticker; (2) if under 21 years of age,

have written consent of his parent or guardian; (3) produce evidence that he may drive in New York State and that the vehicle may be driven there; (4) if he was registered in the Spring Term, 1947, produce evidence that the vehicle is insured at the standard minima of \$5,000-\$10,000-\$1,000. Motorcycles may be registered but may not be used on the campus during class hours. Trailers are not allowed on any University property. Campus parking during class hours may be restricted to certain areas.

CASHING OF CHECKS....The Treasurer of the University accepts checks in settlement of charges payable at his office, but a rule of the Board of Trustees forbids him to cash any credit instrument, even to the extent of accepting a check or draft in amount greater than the sum due and returning the excess in cash. Students are therefore advised to open an account in an Ithaca bank as soon as they arrive in town, or else to provide themselves with travelers' checks, drafts on New York City banks, money orders, or other forms of credit instrument such as a bank will cash in the ordinary course of business.

FOREIGN STUDENTS

The University maintains on its staff a Counselor to Foreign Students whose duty is to look after the welfare of all students from other countries. It is suggested that all foreign students write to him before coming to Ithaca, or call upon him soon after arrival. He will be glad to help them find suitable living quarters and to assist them with introductions. Letters of this kind should be addressed to Mr. Donald C. Kerr, Counselor to Foreign Students, Cornell Cosmopolitan House, 301 Bryant Avenue, Ithaca, N. Y.

LIVING ACCOMMODATIONS

UNDERGRADUATE WOMEN....All undergraduate women and all other students under twenty-one years of age are required to live in Residential Halls or sorority houses and to take their meals there. The Balch Dormitory and other dormitory space as required will be available. For board and room and an allowance of personal laundry there is a uniform charge of \$114.00 for the six weeks' Summer Session.

GRADUATE WOMEN....A limited number of rooms in Residential Halls will be available to graduate women upon application. Information may be secured by writing the office of Residential Halls, Morrill Hall, Ithaca, New York. Information on approved rooms off-campus may be secured by writing the office of the Counselor of Women, Administration Building, Cornell University. Cost of rooms will range from \$4.00 to \$8.00 a week.

GRADUATE AND UNDERGRADUATE MEN. . . . Rooms in Residential Halls for men will be available upon application. The Department of Residential Halls also maintains an office for assisting students in finding off-campus accommodations. Information may be secured by writing the Office of Residential Halls, Morrill Hall, Ithaca, New York. The cost of rooms ranges from \$4.00 to \$8.00 a week, depending upon the desirability and location of the room.

APPLICATION FOR ROOMS. . . . Applications for rooms should be made by filling out the official application form which will be sent with notice of acceptance from the Summer Session office. Floor plans and other information about rooms may be obtained by addressing the Office of Residential Halls, Morrill Hall, Ithaca, New York.

OPENING DATE. . . . All residential halls and cottages for men and women may be occupied on the night of Monday, June 30; earlier occupancy will not be possible.

HEAD RESIDENTS. . . . The Head Residents in charge of the halls are glad to know the students, to advise them in illness or other emergency, and to give them whatever information they wish about the University or the town. It is understood that persons living in the halls will conform to the house regulations made for the convenience and comfort of all.

Applications for rooms should state the exact dates of the proposed attendance of the University.

DEPOSITS WITH APPLICATIONS. . . . A deposit of five dollars must accompany each application for a room in any of the residential halls for the Summer Session; otherwise the application will not be entertained. The rooms are reserved in the order of application. If a room assigned is occupied by the applicant, the amount of the deposit is held until the end of the Session to cover the return of keys and any damage to building or furniture other than ordinary wear and tear, and to insure the completion of the lease. The deposit will be refunded if the applicant gives formal notice to the Manager on or before June 15 that the applicant wishes to withdraw the application.

Checks should be drawn to the order of Cornell University.

DINING ROOMS, CAFETERIAS. . . . The dining facilities of Willard Straight Hall and the cafeterias in Martha Van Rensselaer Hall are open to both men and women students. Board may be obtained at these places and at cafeterias, dining rooms, and restaurants near the campus at \$1.50 to \$2 a day.

HOUSES AND APARTMENTS. . . . Information on houses and apartments for rental may be secured by writing the Office of Residential

Halls, Morrill Hall, Ithaca, New York. In view of the current housing shortage in Ithaca, all students who desire houses or apartments are urged to come to Ithaca in advance of registration to secure quarters. Few listings will be available.

COST OF LIVING . . . An estimate of the cost of living in Ithaca in the summer can be made by consulting the figures given on the preceding page. In private houses rentals vary according to the location. Rooms are rented with the understanding that they will be occupied for the entire Session unless both parties agree otherwise. Table board is generally engaged by the week.

MEANS OF SELF SUPPORT . . . Opportunities are available for those students, both men and women, who wish to work for their board in the residential halls department; applications for such work should be addressed to the Manager of Residential Halls. Applications from women students for other kinds of work should be addressed to Miss Eleanor Simonds, Assistant Counselor of Students. Men who want other kinds of work should write to Mr. Culver Smith, Assistant Counselor of Students.

Students who plan to work outside are warned that a six-hour academic program normally requires full-time work; they should therefore apply to the Director of the Summer Session for permission to take a lighter schedule.

LIBRARIES

The University Library is open on week days from 7:50 a.m. to 10:00 p.m., except on Saturday when it closes at 5:00 p.m. The total holdings of the libraries of the University now exceed 1,200,000 volumes, most of which are shelved in the University Library building. Properly qualified students have access to the seminary rooms in the University Library and graduate students are admitted to the stacks for the purpose of consultation and research. Although the main collection is primarily a library of reference for use in the building, the privilege of borrowing books for home use is granted to all students who comply with the library regulations.

The Library of the New York State College of Agriculture is one of the largest and most complete agricultural libraries in America. In addition to many books on agriculture and related sciences, it includes an extensive collection of scientific publications of governments, institutions, and societies throughout the world. The collection of publications of the U. S. Department of Agriculture and the state and territorial experiment stations and extension services is nearly complete. The Entomological Library in Comstock Hall is outstanding, and includes the most comprehensive collection in the world on the subject of beekeeping.

The College Library in Stone Hall and the Agricultural Economics Library in Warren Hall are open from 8:00 a.m. to 10:00 p.m. each weekday when college is in session, except Saturday, when they close at 5:00 p.m. Most departments in which instruction is given have selected departmental libraries, open during usual office hours. The library catalogue in Stone Hall indexes the contents of all the libraries in the Colleges of Agriculture and Home Economics.

The Library of Recorded Music and scores to parallel these recordings are available in the Music Building for the use of the general student body. This library may be used in the Music Building only during hours to be announced.

HEALTH SERVICE

The Student Medical Clinic at 7 Central Avenue will be available for all registered Summer Session students. Hours at the Clinic will be from 9 a.m. to 12 m. and from 2 p.m. until 4:30 p.m., except Saturday and Sunday. Saturday hours at the Clinic will be from 9 a.m. until 12 m.; Sunday, from 10 a.m. to 11 a.m. A nurse will be in attendance daily from 12 m. until 2 p.m. weekdays, except Saturday. Those desiring to consult a physician after 5 p.m. weekdays, on Saturday afternoons, or on Sunday for an illness or accident of emergency nature may go directly to the Cornell University Infirmary. The night service is not intended for the use of those who could visit the Clinic during the day.

Emergency room call service will be available at a charge of three dollars for night visits and two dollars for day visits. Requests for room visits will be cleared through the Student Medical Clinic, 3331-2336, during the day and through the Infirmary switchboard, Ithaca 2747, after 5 p.m. on weekdays, Saturday afternoons, and Sundays. Patients requiring more than one emergency visit for any one illness will not be treated in their rooms but will be requested to go to the Infirmary.

The Infirmary is a modern hospital and is approved by the American College of Surgeons. It will be available for Summer Session students. Two days' bed nursing, and ordinary medical care will be granted without extra charge to each student registered in the Summer Session. Per diem rates in the Infirmary for registered students beyond the exemption period will be two dollars in a ward and three dollars in a room. There will be no additional charge for extended ordinary medical care.

If a student, while in the Infirmary, wishes to avail himself or herself of a private physician from the visiting staff, he or she is at liberty to do so. A student may also receive medical care from private physicians from the city of Ithaca rather than consult the Clinic. In either case this service is not included in the health fee.

EXTRACURRICULAR EDUCATIONAL PROGRAM

The Summer Session, in cooperation with departments and agencies of the University, arranges a balanced extracurricular program of public events and recreation designed to enrich the campus experience of its students, especially those who are not at the University during the winter months.

THE WEEKLY CALENDAR AND ANNOUNCEMENTS. . . . A weekly calendar and announcement, issued and posted on each Saturday of the Summer Session, contains not only all official notices but details of public events and also interesting news about special activities on the campus. Copies may be obtained without charge at the desk in Willard Straight Hall, at the Summer Session office, and at other University offices. Students are advised to secure copies regularly.

LECTURES. . . Evening Series. A public lecture, open to all Summer Session students, is given each Wednesday evening of the Session. Both nonresident lecturers and members of the faculty will take part in the series, and the subjects are chosen for their general interest and timeliness. In 1946 the lecturers and their topics were:

Frank A. Southard, Jr., Chairman of the Department of Economics. "Rebuilding Europe."

Harold C. Urey, Institute of Nuclear Studies, University of Chicago. "Isotopes in War and Peace."

Thomas W. Mackesey, Professor of Regional Planning and Assistant Dean of the College of Architecture. "Rebuilding our Cities."

Knight Biggerstaff, Professor of Chinese History. "China Faces the Future."

Francis T. Spaulding, Commissioner of Education and President of the University of the State of New York. "Wartime Training in Peacetime Schools."

Afternoon Series. Each Tuesday afternoon one or more lectures, primarily by nonresident lecturers but occasionally by members of the University faculty, are open to all Summer Session students. These lectures, though usually nontechnical, are designed to treat more restricted subjects than are those of the evening series.

READING HOURS. . . . On Sunday evenings, in the Browsing Library at Willard Straight Hall, members of the faculty read aloud passages of literature from their own selection.

SAGE CHAPEL. . . . Religious Services are conducted in Sage Chapel throughout the academic year by clergymen of various religious denominations. There will be services in the Chapel on five Sundays during the Summer Session, July 6 to August 3 inclusive.

CHORUS...All members of the Summer Session who are interested in singing in a chorus of mixed men's and women's voices are asked to meet in the choir loft of Sage Chapel on Wednesday afternoon, July 2, at 5 o'clock. At this time a schedule of rehearsals will be arranged in accordance with the desires of those interested. The chorus will be directed by Professor Woodward.

CONCERTS...A series of Thursday evening concerts is given in the Memorial Room of Willard Straight Hall, open without charge to students in the Summer Session. In 1946 the series included:

Dorothy Minty, violinist
 Leona Scheunemann, soprano
 Erno Balogh, pianist
 University Orchestra, John Kuypers, Director

RECORDED MUSIC...On Sunday afternoons recorded music is broadcast on the Library Slope. If the weather is inclement it is broadcast in the Memorial Room, Willard Straight Hall. Recitals of recorded music are arranged for each Wednesday and Saturday evening in the Music Room, Willard Straight Hall.

RECREATIONAL, FOLK, AND SQUARE DANCING...For students and faculty members on Monday evenings. An instructor is present.

SUMMER THEATRE...During the Summer Session performances are given by the Summer Theatre Company on Friday and Saturday evenings in the Theatre, Willard Straight Hall. Admission is charged. In 1946 the series included:

"The Beautiful People," by William Saroyan.
 "Outward Bound," by Sutton Vane.
 Four One-act Plays.
 "The Damask Cheek," by John van Druten and Lloyd Morris.

The plays of the Summer Theatre Company are under the general direction of Professors Drummond, Stainton, and Albright, assisted by other members of the Direction Staff. Regularly enrolled members of the classes in Dramatic Production, and no others, may compete for places in the casts and production staffs. Detailed announcements will be made in the various classes.

FILMS...Museum of Modern Art Film programs and noteworthy European and American art and documentary films are presented weekly by the Summer Theatre. Admission is charged. In 1946 the following films were shown:

Four Chaplin films
 The House on 92nd Street
 The Baker's Wife

Open City
The Lady Vanishes

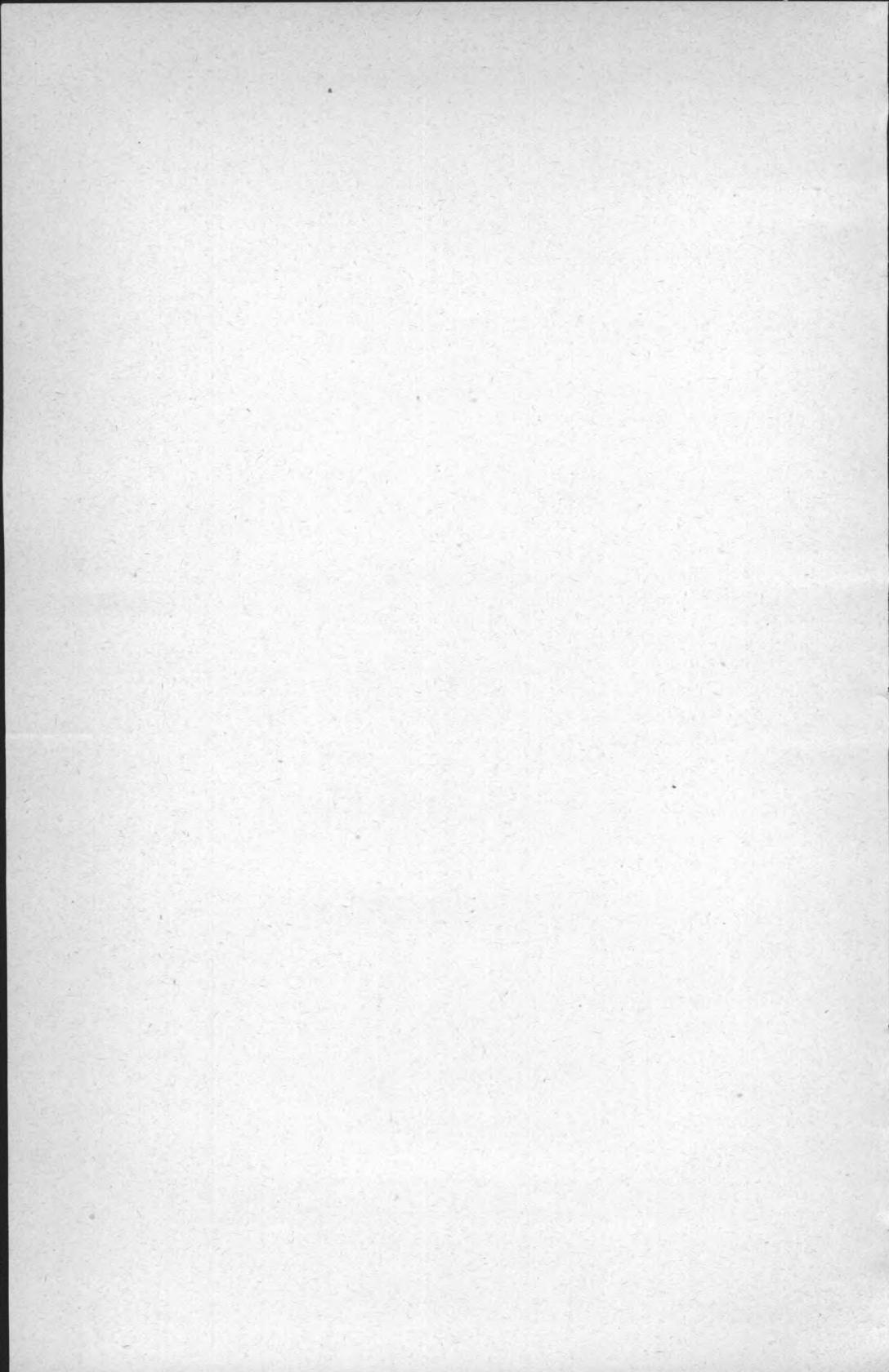
SPORTS... Tennis courts, conveniently located about the campus, are available for use without fee. Private lessons in tennis and golf are offered by members of the Department of Physical Education; tennis, badminton, and golf tournaments and a swimming meet are arranged as part of the recreational program of the Summer Session. A nine-hole golf course is operated by the Department of Physical Education and Athletics; for information about conditions for its use and fees, address Mr. R. F. Kane, Schoellkopf Building, Cornell University. A gorge at one end of Beebe Lake, on the campus, forms a natural swimming pool, where a guard is on duty every day of the Session.

EQUITATION... An extracurricular course includes instruction in nomenclature, care, grooming, and feeding, as well as saddling and unsaddling, work at the walk, trot, and gallop, passage over obstacles, trail riding, and horse show. Address all inquiries about hours and fees to: Director Equitation Course - Summer Session, Barton Hall, Ithaca, New York.

WILLARD STRAIGHT HALL, the student union of Cornell University, contains lounges for men and women, rooms for student meetings, for games and for dancing, the University Theatre where motion pictures and dramatic productions are given each week, a billiards and game room, a barber shop for men, a browsing library well stocked with books of general interest, and a music and art room. On the upper floors of the Hall are sleeping rooms used principally by parents and guests of students, by alumni, and by guests of the University.

The Board of Managers of Willard Straight Hall not only cooperates in some of the events listed above, but also arranges for dances, teas, games, art exhibits, and other recreation and entertainment.

Willard Straight Hall is for the use of members of the University; but guests of members may secure guest cards for limited periods upon application to the Director of the Hall.



THE CURRICULUM

COURSES OF INSTRUCTION are listed by fields of instruction, alphabetically arranged. For offerings in particular subjects, consult the Index. Because of other demands which may be placed upon the instructing staff, it may be necessary to substitute other instructors for the ones named in the course descriptions. The Director reserves the right to cancel any course for which, through unforeseen circumstances, satisfactory instruction or facilities cannot be provided.

UNIT COURSES. . . Unit courses, less than six weeks in length, are indicated by asterisks and their dates are given in the descriptions.

CLASS SCHEDULES. . . In most courses of instruction, classes will meet five times a week, on each weekday except Saturday. All classes scheduled for Monday will meet at the same hour on Saturday, July 5, to make up for loss of class meetings in the first week. In case of conflict with a scheduled Saturday class, notify the office of the Summer Session. Class periods begin on the hour unless otherwise indicated, and are fifty minutes in length. Laboratory periods are of various lengths, as indicated in the description of courses which include laboratory work.

ROOM SCHEDULES. . . The meeting places of courses will be given in a special announcement which will be furnished at the time of registration.

SCHEDULE OF EXAMINATIONS. . . With a few exceptions, examinations will be held on Friday, August 8, and Saturday, August 9, at hours indicated by the schedule below; in the exceptional cases, the examination will be held on Thursday, August 7, at 2. The usual class rooms will be used unless a change is announced by the instructor.

In courses which meet for more than one hour daily, the examination period is determined by the first hour at which they meet. For example, Spanish S 1 meets daily at 8, 11, and 12; the examination will be held on Friday at 8. In courses which include both lecture and laboratory periods, the examination period is determined by the lecture hour. In courses in which no examination is to be given, an announcement to

that effect will be made by the instructor; in such cases the last meeting of each course will be held in the examination period for that course.

Examinations will be held as follows:

- 8 o'clock classes, Friday at 8.
- 9 o'clock classes, Saturday at 8.
- 10 o'clock classes, Friday at 10:30.
- 11 o'clock classes, Saturday at 10:30.
- 12 o'clock classes, Friday at 2.
- Afternoon classes, Saturday at 2.

COURSES

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Philosophy and Psychology	28
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Industrial and Labor Relations	32
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FINE ARTS

ART, HISTORY AND APPRECIATION

S 1b. *INTRODUCTION TO RENAISSANCE AND MODERN ART*...Undergraduate: credit two hours. Daily except Saturday 9. Professor WAAGE.

The relationship of art to society in Western Europe from 1400 to the present, as exemplified in the works of the major painters and sculptors.

S 7b. *TWENTIETH CENTURY ART*. Undergraduate and graduate; credit two hours. Prerequisite, S 1a or b or 7a or previous work in the history or practice of art. Daily except Saturday 12. Professor WAAGE.

The consequences of the divorce of painting and sculpture from social function; painters' painting and expressionism; individualistic and clique vagaries; attempts toward reintegration.

DRAWING AND PAINTING

S 201. *ARTS AND CRAFTS*...Undergraduate and graduate; credit two hours. Daily except Saturday 2-4:30. Assistant Professor DALY.

Creative studio work in the graphic arts such as linoleum, monotype, and textile printing, mask designing, and allied work in applied design.

S 211. *WORK SHOP FOR THE ART TEACHER*...Graduate; two hours. Daily except Saturday 10-12:30. Assistant Professor DALY.

Problems of materials and methods for teaching art in the primary and secondary schools. General discussion of integration of art projects in the public school art curriculum. Reading and reports required of students.

MUSIC

S 21b. *THE HISTORY OF MUSIC*...Undergraduate; credit two hours. Daily except Saturday 11. Mr. WOODWARD.

A survey of the evolution of the art of music, with special reference to the development of musical styles from period to period. This part of the course covers the period from the time of Bach and Handel (approximately 1750) until the present day.

APPLIED MUSIC...Persons interested in individual instruction in piano, violin, and voice should correspond directly with Professor JOHN M. KUYPERS, 320 Wait Avenue.

CHORUS...All men and women interested in singing in a chorus may report to Mr. WOODWARD at 5 p.m. on Wednesday, July 2, in the choir loft of the Sage Chapel, for discussion of plans and decision on a suitable schedule of rehearsals.

ENGLISH, JOURNALISM, SPEECH,
AND DRAMATICS

ENGLISH

S 23. *INTRODUCTION TO THE DRAMA*...Undergraduate and graduate; credit two hours. Daily except Saturday 8. Dr. DETMOLD.

Representative plays from Greek to recent times.

S 27a. *THE SHORT STORY*...Undergraduate and graduate; credit two hours. Daily except Saturday 8 or 9. Associate Professor CRAIG THOMPSON and Dr. DEARING.

The short story as a literary form.

S 35a. *THE ROMANTIC POETS*...Undergraduate and graduate; credit two hours. Daily except Saturday 10. Professor CHAPMAN.

The principal subjects this summer will be poems of Wordsworth and Coleridge.

S 36a. *POETRY OF THE VICTORIAN AGE*...Undergraduate and graduate; credit two hours. Daily except Saturday 12. Associate Professor FRENCH.

The poetry of Browning, Arnold, and others.

S 39b. *AMERICAN LITERATURE SINCE THE CIVIL WAR*...Undergraduate and graduate; credit two hours. Daily except Saturday 9. Professor HAROLD THOMPSON.

Emphasis upon trends in poetry (from Whitman), realism, and democratic ideals.

S 48. *MODERN DRAMA*...Undergraduate and graduate; credit two hours. Daily except Saturday 11. Dr. DETMOLD.

The drama since Ibsen; important European and American plays; types and forms.

S 54. *RECENT AMERICAN POETRY*...Undergraduate and graduate; credit two hours. Daily except Saturday 10. Associate Professor FRENCH.

American poets of this century: Robinson, Frost, Sandburg, Eliot, MacLeish, and others.

S 61a. *SHAKESPEARE*...Undergraduate and graduate; credit two hours. Daily except Saturday 9. Associate Professor DAICHES.

Shakespeare's dramatic art as illustrated in the comedies and histories.

S 63. *MILTON*...Undergraduate and graduate; credit two hours. Daily except Saturday 11. Associate Professor CRAIG THOMPSON.

Readings in Milton's poetry and its backgrounds.

S 82. *THE HISTORY OF THE ENGLISH LANGUAGE*...Undergraduate and graduate; credit two hours. Daily except Saturday 11. Professor CHAPMAN.

The formation of the language; vocabulary; phonology; semantics; and other topics.

S 84. *CREATIVE WRITING: NARRATIVE*...Undergraduate and graduate; credit two hours. Daily except Saturday 10. Dr. CALVER.

A critical approach to the problems of writing through practice, experiment, and discussion.

S 85. *CREATIVE WRITING*...Undergraduate and graduate; credit two hours. Daily except Saturday 12. Dr. CALVER.

A more general course than the preceding, with attention to exposition and description.

S 136. *SEMINAR: ENGLISH LITERATURE*...Graduate; credit two hours. Hours to be arranged. Associate Professor DAICHES.

The work of William Butler Yeats, and related topics. The instructor's consent is necessary before enrolling.

S 141. *SEMINAR: AMERICAN LITERATURE*...Graduate; credit two hours. Hours to be arranged. Professor HAROLD THOMPSON.

Topic to be selected. The instructor's consent is necessary before enrolling.

S 901. *SPECIAL TOPICS FOR INVESTIGATION*...Graduate; credit and hours to be arranged.

Independent investigation for those who may profitably supplement courses described above or carry through their studies without attending classes. The course is administered by various members of the staff; students who wish to be put into touch with a suitable director for the work they have in mind should consult or write Professor W. H. FRENCH.

JOURNALISM

S 15. *ELEMENTS OF JOURNALISM*...Undergraduate and graduate; credit two hours. Daily except Saturday 11. Professor ADAMS.

The principles of journalistic writing, with special emphasis on the writing of news, but with some instruction in the writing of editorials, criticisms, reports, and news features.

S 122. *SPECIAL ARTICLES*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Professor ADAMS.

The writing of non-fiction articles for newspapers and magazines.

SPEECH AND DRAMA

Students may confer either with the departmental representatives in Barton Hall, or with individual instructors, who will be in their offices both on registration day and on the first day of instruction. For information about advanced work in Speech Training and Phonetics, consult Professor Boomsliter, Goldwin Smith 25; in Rhetoric and Public Speaking, Professor Wagner, Goldwin Smith 233; in Drama and Theatre, Professor Drummond, Goldwin Smith 127, Professor Stainton, Goldwin Smith 239, or Professor Albright, Goldwin Smith 249.

S 1. *PUBLIC SPEAKING*... Undergraduate; credit two hours. Daily except Saturday 9 or 11. Associate Professor WAGNER, Assistant Professor ARNOLD, and staff.

Practice in speech-making, on topics of current interest. Methods of preparation and delivery studied in relation to practice; class discussion; conferences. Regular students passing the course are admitted to Public Speaking 102 and 213.

S 7. *DISCUSSION*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Associate Professor WAGNER.

Principles and practice of group thinking; an introduction to systematic investigation and reflective thinking, with application to current questions; practice in various types of group discussion.

S 10. *ORAL INTERPRETATION OF LITERATURE*... Undergraduate; credit two hours. Daily except Saturday 11. Assistant Professor ARNOLD.

Study, for understanding and appreciation, of poetry selected from the best English and American writers; practice in reading aloud; conferences.

S 14. *PUBLIC DISCUSSION IN AMERICAN LIFE*... Undergraduate and graduate; credit two hours. Daily except Saturday 11. Professor WICHELS.

A critical study of the discussion of public affairs, oral and written, as a social force in various ages of democracy; the principal types, examples, and conditioning factors. Lectures, readings, reports.

S 22. *RHETORICAL CRITICISM*... Graduate; credit two hours. M 2-4:30 and hours to be arranged. Associate Professor WAGNER.

The principles of criticism applied to selected speeches, chiefly British and American. Reports and discussions.

S 28. *THE TEACHING OF SPEECH IN SECONDARY SCHOOLS*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Professor WICHELS.

A study of outstanding problems in the teaching of speech, with emphasis on oral English and public speaking: aims, methods, and materials, organization of courses and of activities; recent reports, syllabuses, and experiments in their bearing on classroom procedure; some practice in effective speaking and oral reading.

S 30. *VOICE TRAINING*... Undergraduate; credit two hours. Daily except Saturday 8. Assistant Professor BOOMSLITER.

An elementary course for the improvement of the speaking voice. Individual and group practice in the overcoming of such faults as nasality, weak quality, and indistinctness. Attention to the principles of voice production.

S 32. *TEACHERS' COURSE IN PHONETICS AND SPEECH TRAINING*... Undergraduate and graduate; credit two hours. Daily except Saturday 10. Assistant Professor BOOMSLITER.

A study of English phonetics, pronunciation, and the improvement of speech; primarily for secondary and elementary school teachers.

S 41. *DRAMATIC PRODUCTION*... Undergraduate and graduate; credit two hours. Daily except Saturday 10. Associate Professor STANTON.

For upperclassmen and graduates. Theory of stage direction; fundamentals of theatrical mounting; survey of practical phases of production. Prerequisite for further work in Dramatic Production.

S 42. *DRAMATIC INTERPRETATION AND ACTING*... Undergraduate and graduate; credit two hours. M W F 3-5. Associate Professor ALBRIGHT.

A practice course in oral interpretation, pantomime, acting, and group rehearsal.

S 55. *THE MOTION PICTURE: A SURVEY*... Undergraduate and graduate; credit two hours. Daily except Saturday 12. Associate Professor STANTON.

The development of the motion picture as a modern art. Characteristic problems and devices of the art; economic and social aspects; the documentary film; the educational film.

S 66. *BACKGROUNDS OF MODERN STAGE PRESENTATION*... Undergraduate and graduate; credit two hours. Daily except Saturday 2:15. Professor DRUMMOND.

Aesthetic principles of theatrical presentation, with special attention to the development of modern theatre art and criticism. Lectures, readings, reports; textbook, Gorelik's *New Theatres For Old*.

S 90. *THEATRE WORKSHOP*... Undergraduate and graduate; credit two or four hours. Hours to be arranged. The Theatre staff.

Technical practice coordinated with the regular productions of the Summer Theatre; readings in the techniques involved.

S 100. *THESES AND SPECIAL PROBLEMS IN PUBLIC ADDRESS*... Graduate; credit two or more hours. Consult Professor WICHELNS.

S 300. *THESES AND SPECIAL PROBLEMS IN DRAMA AND THEATRE*... Graduate; credit two or more hours. Professor DRUMMOND.

Required of regularly registered graduates working on theses. Open to other graduates prepared for the independent study of special topics in drama and the theatre.

SPEECH CLINIC... No credit. For students working under the direction of the department. Assistant Professor BOOMSLITER. By appointment.

The courses required for the degree of Master of Arts in Public Speaking and Speech Training are offered through a rotation of courses in a minimum of five summers. Candidates will take, or offer suitable equivalents for S 1, S 2, and S 10; six hours in each of the following four divisions: Rhetoric and Public Speaking S 14, S 20, S 21, S 22, S 28; Speech Improvement and Phonetics, S 32, S 33, S 34, S 36, S 36a, S 36b; Dramatic Production, S 41, S 42, S 44, S 45, S 48, S 66, S 68, S 90; electives in English, History, Government, Sociology, Psychology. In addition, each candidate will offer four hours in one of the three departmental divisions and during the final summer will register in S 100 or S 200 for the writing of a thesis or extended essay.

The courses required for the degree of Master of Arts in Dramatic Production are offered through a rotation of courses in a minimum of five summers. Candidates will take, or offer suitable equivalents for S 1, S 10, S 41; in Drama and Theatre six hours from S 45, S 45a, S 48, S 66, S 68; eight hours from S 42, S 44, S 45a, S 90, S 95; in Dramatic Literature, English S 23, English S 48; in Speech Improvement and Phonetics, six hours from S 32, S 33, S 36, S 36a, S 36b; in Rhetoric and Public Speaking, four hours; and during the final summer will register in S 300 for the writing of a thesis or extended essay based on one of the advanced courses.

LANGUAGES

CLASSICS

S 1. *FOUNDATIONS OF WESTERN THOUGHT*... Undergraduate and graduate; credit two hours. Daily except Saturday 10. Associate Professor SOLMSEN.

A study of the beliefs and ideas — religious, moral, social, and scientific — which were current or put forward in the Greek, Roman, and Early Christian period of Western Civilization. Popular thought and practices as well as the ideas of leading thinkers and poets will be considered. Reading of representative material in translation.

S 2. *VIRGIL*... Graduate (undergraduate by permission); credit two hours. Daily except Saturday 11. Associate Professor SOLMSEN.

The Aeneid; Virgil's epic art and style; place of the Aeneid in the history of epic poetry; the fusion of Homeric and Roman themes; the love theme in the heroic epos. Readings in the Aeneid in Latin.

S 3. *THESES AND INFORMAL WORK*... Graduate; credit by arrangement; total credit for thesis may not exceed six hours. Associate Professor SOLMSEN.

The informal work may consist of readings in a Latin or Greek author appropriate to the needs of the individual student.

In the summer of 1948 the department plans to offer:

S 1. Greek and Latin Masterpieces in English Translation.

S 2. Caesar. A Study of Caesar's *Civil War* (historical, political, and linguistic).

S 3. Theses and Informal Work.

FRENCH

S 1. *ELEMENTARY COURSE*... Undergraduate; credit six hours. Three hours daily except Saturday 8, 11, and 12. Assistant Professor MOSER.

The fundamentals of French with special emphasis on acquiring a speaking knowledge of the language. Reading of French prose and practice in composition. This course is not the equivalent of French 1 in the Division of Language.

SPANISH

S 1. *ELEMENTARY COURSE*... Undergraduate; credit six hours. Three hours daily except Saturday 8, 11, and 12. Mrs. RODRIGUEZ-DIAZ.

The fundamentals of Spanish with special emphasis on acquiring a speaking knowledge of the language. Reading of Spanish prose and practice in composition. This course is not the equivalent of Spanish 1 in the Division of Language.

S 53. *THE TWENTIETH CENTURY SPANISH-AMERICAN NOVEL*... Undergraduate and graduate; credit two hours. Daily except Saturday 10. Professor DALE.

Lectures in Spanish, together with a critical analysis of at least one outstanding novel.

S 54. *THE MODERNIST MOVEMENT IN SPANISH-AMERICAN LITERATURE*... Undergraduate and graduate; credit two hours. Daily except Saturday 11. Professor DALE.

Lectures in Spanish, together with reading and critical examination of Modernist masterpieces.

S 60. *SPECIAL TOPICS*... Graduate; credit one or two hours. Consult Professor DALE.

CHINESE

S 101. *INTENSIVE ELEMENTARY LANGUAGE* (Peiping dialect)... Undergraduate and graduate; credit six hours. First half of S 101-102 below.

CHINESE LANGUAGE INSTITUTE

The Division of Language offers a twelve-week course, July 1-September 19, as follows:

S 101-S 102. *ELEMENTARY COURSE IN COLLOQUIAL CHINESE*... Undergraduate and graduate; credit twelve hours. Daily except Saturday 8-12. Assistant Professor HOCKETT and staff.

This course will cover the material of the first year's work in Chinese of the regular school year (101-102); training in conversational Chinese in drill groups of not to exceed ten in the presence of native speaker of Peiping dialect, and a brief introduction to the Chinese writing system. Tuition fee, \$120.

PHILOSOPHY AND PSYCHOLOGY

PHILOSOPHY

S 1a. *PHILOSOPHICAL CLASSICS*... Undergraduate; credit two hours. First course. Daily except Saturday 8. Assistant Professor BROWN.

A careful study of Lucretius' *On the Nature of Things*, Plato's *Republic*, and J. S. Mill's *On Liberty*. In studying Plato and Mill, special attention is paid to this philosophy of democracy.

S 13. *PHILOSOPHY OF RELIGION*... Undergraduate and graduate; credit two hours. Daily except Saturday 10. Assistant Professor BROWN.

A study of the major types of religious belief in the modern world in relation to their philosophical background. Special attention is given to the interaction between religion and democratic ideals.

PSYCHOLOGY

S 1. *ELEMENTARY PSYCHOLOGY*... Undergraduate; credit two hours. Daily except Saturday 9. Assistant Professor MARCUSE.

This course is accepted as a prerequisite for subsequent courses and may be credited toward the satisfaction of the major requirements in psychology. The course deals with the following topics: response mechanism, motivation, learning and conditioning, sensation and perception, emotion, personality, intelligence and race.

S 15. *ABNORMAL PSYCHOLOGY*... Undergraduate and graduate; credit two hours. Daily except Saturday 8 or 10. Professor LIDDELL.

Physiological and psychological aspects of mental disorder in war and peace.

S 18. *PROBLEMS OF HUMAN BEHAVIOR*... Undergraduate and graduate; credit two hours. Daily except Saturday 10. Prerequisite S 15 or equivalent. Assistant Professor MARCUSE.

This course has special application for pre-medical students as well as those interested in clinical psychology. The course emphasizes psychosomatic methodology. Topics include hypnotherapy, electroencephalography, eugenics, theory and application of clinical tests.

S 51. *PSYCHOLOGY IN BUSINESS AND INDUSTRY*... Undergraduate and graduate; credit two hours. Prerequisite Psychology, 1 or 41. Daily except Saturday 9. Professor RYAN.

Methods and results of research upon psychological problems in industry and business, such as vocational selection, job training, industrial production, worker motivation and efficiency.

S 52. *INTRODUCTION TO APPLIED PSYCHOLOGY*... Undergraduate; credit two hours. Prerequisite Psychology 1. Daily except Saturday 11. Professor RYAN.

A survey of special fields of application such as vocational guidance and placement, study methods, public opinion, propaganda and advertising, legal psychology and highway safety.

A 116. *CHILD PSYCHOLOGY* (Genetic Psychology)... Undergraduate and graduate; credit two hours. Daily except Saturday, 10. Assistant Professor BAYNE.

Man's behavioral development through infancy and childhood to adolescence. The study of the development of behavior in relation to general psychology.

MENTAL HYGIENE

S 1. *MENTAL HYGIENE*... Graduate; credit two hours. Daily except Saturday 9. Dr. DARLING.

The human being considered as a psychobiologic unit in a complex environment. Discussion of (1) general personality structure, (2) maladjustment factors functioning at different ages from infancy through life, (3) the more common maladjustment symptoms and mental illnesses and their prevention.

SOCIAL SCIENCE

ECONOMICS

S 104. *ELEMENTS OF ECONOMICS*... Undergraduate and graduate; credit four hours. Daily except Saturday 10-12.

A general survey of the economic system, with special reference to the mechanism of price determination. This course is prerequisite to all other courses in economics.

S 205. *MONEY AND BANKING*... Undergraduate and graduate; credit two hours. Prerequisite, an introductory course in economics. Daily except Saturday 9. Assistant Professor FERGUSON.

An introductory course in the nature of money and credit and of the banking system. Attention will be given to the development and execution of monetary policy by central banks and other agencies.

S 340. *COMPARATIVE ECONOMIC SYSTEMS*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Professor BOULDING.

An examination of the theory, structure, and functioning of the economy under various forms of organization.

S 408. *CONTEMPORARY LABOR ISSUES*... Undergraduate and graduate; credit two hours. Prerequisite, an introductory course in economics. Daily except Saturday 10. Professor MONTGOMERY.

A survey and analysis of some of the more important industrial relations, trends, and problems. Among the topics treated: wage policies and employment; industrial disputes of the postwar period; trends in the organized labor movement; the processes of collective bargaining; and government policy toward labor.

S 611. *ECONOMIC HISTORY OF THE UNITED STATES*... Undergraduate and graduate; credit two hours. Prerequisite, an introductory course in economics. Daily except Saturday 11.

A study of the economic development of the United States.

S 902. *NATIONAL WEALTH AND INCOME*... Undergraduate and graduate; credit two hours. Prerequisite, an introductory course in economics. Daily except Saturday 11. Professor MONTGOMERY.

A statistical approach to the structure of the American economy, through studies of the size, composition, and distribution of the national income, with applications to the problems of economic planning.

S 982. *PROBLEMS IN ECONOMICS*... Graduate; credit and hours to be arranged. Professor MONTGOMERY.

This is a seminar course designed primarily for candidates for the advanced degrees in economics, but others may be admitted by permission of the instructor. The problems will be selected so far as possible from among the research interests of the students.

GEOGRAPHY

(See GEOLOGY and GEOGRAPHY)

GOVERNMENT

S 1. *AMERICAN GOVERNMENT*... Undergraduate; credit two hours. Daily except Saturday 12. Professor GEORGE.

A general introduction to American national government and politics.

S 4. *POLITICAL PARTIES IN THE UNITED STATES*... Undergraduate and graduate; credit two hours. Daily except Saturday 10. Professor GEORGE.

Bases, composition, organization, functions, methods, and finance of political parties.

HISTORY

S 15. *AMERICAN HISTORY: 1783-1850*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Professor GATES.

A study of the early national period, the molding of the constitution, the growth of democracy and nationalism, industrial beginnings, settlement of the west.

S 16. *THE CIVIL WAR AND RECONSTRUCTION: 1850-1876*... Undergraduate and graduate; credit two hours. Daily except Saturday 11. Professor GATES.

A study of the economic and social forces leading to disunion; the constitutional and political changes of the Civil War period and the emergence of modern America.

S 20. *THE GROWTH OF EUROPEAN CIVILIZATION, 10th TO 14th CENTURY*... Undergraduate; credit two hours. Daily except Saturday 8. Professor STEPHENSON.

An elementary course, with lectures and reading intended to introduce the student to the central period in medieval history.

S 27. *PROBLEMS IN THE SOCIAL HISTORY OF THE MIDDLE AGES*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Professor STEPHENSON.

An advanced course, with discussion of such topics as agrarian society, feudal institutions, the revival of commerce, the rise of the bourgeois class, and the beginnings of capitalism.

S 47. *RUSSIA IN THE TWENTIETH CENTURY*... Undergraduate and graduate; credit two hours. Daily except Saturday 11. Associate Professor DORPALEN.

Stresses social, economic, religious, cultural, and political trends.

S 49. *HISTORY OF GERMANY: 1871 TO THE PRESENT*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Associate Professor DORPALEN.

A survey of political, social, and economic developments since the foundation of the German Empire. The Weimar and Nazi periods as well as postwar trends will be discussed in detail.

S 70. *LATIN AMERICA SINCE INDEPENDENCE*... Undergraduate and graduate; credit two hours. Daily except Saturday 8. Professor WHITAKER.

The development of the independent states of Latin America from 1825 to the present, with special attention to the heritage of the colonial regime, the impact of foreign business enterprise, technology, and ideologies, and the rise of cultural and economic nationalism.

S 72. *UNITED STATES AND LATIN AMERICA IN THE TWENTIETH CENTURY*... Undergraduate and graduate; credit two hours. Daily except Saturday 10. Professor WHITAKER.

The development of political, economic, and cultural relations between the United States and Latin America from 1898 to the present, as a phase of the emergence of the United States as a world power.

SOCIOLOGY

A 1. *GENERAL SOCIOLOGY*... Undergraduate; credit two hours. Daily except Saturday 8. Professor ANDERSON.

An introduction to the study of the organization and functioning of society; its group, ecological, and institutional patterning; and the processes of social interaction.

A 12. *RURAL SOCIOLOGY*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Associate Professor LARSON.

This course is designed to meet the special needs of teachers, extension and social welfare workers, and others who work in rural communities. A study of the people, groups, and institutions, and recent trends in rural society in the United States with emphasis on application to local community situations.

S 32. *METHODS OF WORKING WITH GROUPS*... Advanced undergraduate and graduate; credit two hours. Daily except Saturday 10. Assistant Professor HEARN.

Practical applications of recent developments in social psychology, in procedures and techniques for working with a variety of groups, such as committees, conferences, discussion groups, community groups and organizations, industrial groups, etc. Emphasis will be given to the development of a basic understanding of the dynamics of group processes as well as to training in practical techniques.

S 33. *TECHNIQUES FOR DEALING WITH GROUP CONFLICT*... Advanced undergraduate and graduate; credit two hours. Daily except Saturday 8. Assistant Professor HEARN.

This course will be concerned with techniques for dealing with racial, cultural, class, and other community group conflict situations as well as ways of organizing communities for preventive and remedial action.

A 113. *RURAL SOCIAL PROBLEMS*... Undergraduate and graduate; credit two hours. Daily except Saturday 11. Associate Professor LARSON.

A survey of the social aspects of significant problems in American agriculture and rural life such as low income groups, farm labor, farm tenancy, minority groups, rural health and welfare, population pressure, and problem areas. A consideration of action programs in operation or proposed to meet the problems.

A 207. *CONTEMPORARY SOCIOLOGICAL THEORIES*... Graduate (undergraduate by permission); credit two hours. Daily except Saturday 10. Professor ANDERSON.

An analysis of contemporary social theories and their implications for a system of sociology.

INDUSTRIAL AND LABOR RELATIONS

I 10. *INTRODUCTION TO INDUSTRIAL AND LABOR RELATIONS*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Assistant Professor THURBER.

Survey of the social, economic, political, and intellectual influences in the American scene which have shaped the nature and proposed solutions of problems in industrial and labor relations. Particular attention is given to programs of management and labor in industrial relations. Introduction to governmental agencies such as state and federal labor relations boards, mediation agencies, etc.

I 44. *HUMAN RELATIONS IN INDUSTRY*... Undergraduate and graduate; credit two hours. Prerequisite, Psychology 1, or equivalent. Daily except Saturday 10. Professor SMITH.

An analysis and appraisal of the psychological and social factors affecting human relations in industry as they are conditioned by machine technology, the policies and practices of industrial and labor organizations, community institutions, and individual and group behavior patterns.

I 47. *WORKERS EDUCATION*... Undergraduate and graduate; credit two hours. Daily except Saturday 11. Assistant Professor ELEANOR EMERSON.

General survey of field of workers' education including its history in the United States, designed particularly for those concerned with adult education; materials; methods; university projects; proposed federal legislation; current projects of international unions, state federations and local unions, and private organizations.

See Industrial and Technical Education courses, under EDUCATION.

AGRICULTURE

See also BIOLOGICAL SCIENCES.

AGRICULTURAL ECONOMICS

A 202. *FARM MANAGEMENT*... Graduate (undergraduate by permission); credit three hours. Lectures, daily except Saturday 9; laboratory, F 1:40-6. Professor CUNNINGHAM.

A special course intended primarily for county agricultural agents, high school teachers of agriculture and others who have had previous training in farm management and wish to make a review in this field. Emphasis will be placed on farming as a business, farm accounts and surveys, factors affecting farm incomes, planning the organization and management of specific farms. Field trips will be taken to farms in nearby regions during most of the laboratory periods. Approximate cost of transportation, \$10. Fee for materials, \$2.

A 295. *SPECIAL PROBLEMS*... Graduate; credit one or more hours. Prerequisite, permission of the professor. Professor CUNNINGHAM.

AGRICULTURAL ENGINEERING

A 101. *ELECTRICITY AND ELECTRICAL EQUIPMENT FOR THE FARM AND THE HOME*... Undergraduate and graduate; credit three hours. Lectures, M W 8-10; laboratory, T Th 2-4:30. Associate Professor WRIGHT.

A study of the nature of electricity, electrical wiring and electrical appliances, including motors, with special emphasis upon the uses of these on the farm and in the home. Laboratory fee, \$2.50.

A 104. *RURAL WATER SUPPLY AND SEWAGE DISPOSAL*... Undergraduate and graduate; credit two hours. Lectures, T Th 11; laboratory, M W 2-4:30. Associate Professor WRIGHT.

A study of methods and problems of obtaining adequate water supply in rural areas, including developing sources, pumping equipment, and plumbing systems. A brief study made of methods of sewage disposal. Laboratory fee, \$2.50.

A 141. *GENERAL SHOP WORK FOR RURAL HIGH SCHOOL TEACHERS*... Undergraduate and graduate; credit three hours. M W F 10-12:30 and three recitation periods to be arranged. Professor ROEHL.

Practical jobs to develop skill in woodworking, saw filing, tool grinding, handle fitting, harness repairing, rope work, cold metal working, farm blacksmithing, painting and glazing, furniture repairing and refinishing, as suited to the needs of rural communities.

A course for teachers of agricultural and general shop work in rural high schools, designed to develop skill in performance and teaching. Study made of shop objectives, shop planning, curriculum construction and organization, procedures in shop instruction and shop management. Laboratory fee, \$3.00.

A 251. *SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING*... Undergraduate and graduate; credit one or more hours. Prerequisite, adequate ability and training for the work proposed, and permission to register. Professors and staff of the department.

Special work in any branch of Agricultural Engineering on problems under investigation by the department or problems of special interest to the student if adequate facilities can be obtained. Laboratory fee as arranged.

HOME ECONOMICS

The courses in the Summer Session of the New York State College of Home Economics are planned primarily to meet the needs of teachers, extension workers, social service workers, and others who deal with homemaking practices and problems. Courses aim to strengthen the home economics background of these groups, to discuss problems pertinent to the situations in which they work, and to help them meet these problems more adequately.

Since Summer Session students in the field of Home Economics constitute a mature group, largely made up of professional persons, the approach in courses, even those of an introductory nature, is quite different from that in courses of similar title offered during the regular college year. Hence most of the courses are marked "graduate." Undergraduates are occasionally admitted to those courses, but only by permission of the instructor; such permission should be secured by correspondence with the instructor in advance of registration.

In the following pages, courses in Home Economics are listed by departments alphabetically arranged. In registering, students should give the course number, the name of the department, and the title of the course.

CHILD DEVELOPMENT AND FAMILY RELATIONSHIPS

E 310. *PRINCIPLES FOR CHILD GUIDANCE*. Graduates (undergraduates by permission); credit two hours. No prerequisite, but a basic course in child psychology is desirable. Discussions daily, except Saturday 8; nursery school observations, three hours a week, to be arranged. Associate Professor REEVES.

The behavior of young children and the influence of adults upon their learnings will be observed and studied as a basis for developing principles of guidance. Observations, to include typical activities, will be scheduled at different hours of the day. Fee, \$5.

E 330. *PARTICIPATION IN NURSERY SCHOOL*... Graduate; credit two hours. Limited to twelve students. Open to home economics teachers, and other students with qualifications satisfactory to the instructor. Prerequisite or parallel, course in

child guidance. Laboratory hours to be arranged; conference, M W 12. Associate Professor REEVES.

Observation and study of young children in the nursery school group. Participation in their care and guidance. For each hour of credit there will be required a total of thirty hours of supervised participation in the nursery school and several conferences each week with staff members. Some experience is offered in planning a child-activity program, and in cooperation with staff and parents concerned. Fee, \$5.

E 380. *THEORY AND TECHNIQUES OF FAMILY COUNSELING*...Graduate; credit two hours. Prerequisite, a course in Dynamics of Personality or Family Relationships and Personality Development or permission of instructor. Daily except Saturday 11. Professor WYLIE.

For teachers and others who want to understand the place of counseling in human relationship and who want to become more effective in counseling. Consideration will be given to the directive and non-directive approach and to the process of counseling. Fee, \$5.

E 430. *RESEARCH IN CHILD DEVELOPMENT AND FAMILY RELATIONSHIPS*...Graduate; credit one or two hours. Registration by permission of the instructor; hours to be arranged. Professor WYLIE.

E 460. *FAMILY RELATIONSHIPS AND PERSONALITY DEVELOPMENT*...Graduate; credit two hours. No prerequisite, but basic courses in psychology and sociology are desirable. Daily except Saturday 10. Professor ROCKWOOD.

A study of the regular progression in the type of family relationship which the individual sustains to other members of the family throughout the life cycle.

Among the topics considered are the importance of the family experience in the personality development and the socialization of the child; problems of family relationships which are inherent in the structure of the family or which arise out of the current milieu. Fee, \$5.

FAMILY RELATIONSHIPS (see Home Economics Education E 436B)...Included as a part of the Home Economics Education Workshop.

ECONOMICS OF THE HOUSEHOLD AND HOUSEHOLD MANAGEMENT

E 130. *ECONOMIC CONDITIONS IN RELATION TO THE WELFARE OF FAMILIES*...Graduate; credit two hours. Daily except Saturday 8. Associate Professor ROLLINS.

Changes that have taken place in the economic welfare of families in this country, and some of the factors related to these changes. Importance of production, price, and distribution in family welfare; national income as it relates to family incomes; connection between outside economic conditions and personal financial problems. Fee, \$1.

E 250. *MANAGEMENT PROBLEMS IN FAMILY MEALS*...Graduate; credit two hours. Discussion, laboratory, and field investigations, M 12, T Th 11 & 12, F 12. Mrs. HEINER.

The application of management procedures to the planning and preparation of family meals. Cost comparisons in terms of time, money, and nutritive aspects, under different conditions of family living. Fee, \$2.

E 270. *SIMPLIFICATION OF WORK IN THE HOME*...Graduate; credit two hours. Discussions, laboratory, and field investigations, M W F 9-11. Mrs. HEINER.

Review of techniques of work simplification suited to the home as contrasted with industry. Application of these procedures to the design of kitchens and other activity centers. Fee, \$1.

E 310. *MANAGEMENT IN FAMILY LIVING*...Graduate; credit two hours. Discussions, laboratory, and field trips, M F 2-5. Assistant Professor REMSBERG.

Study of the process of management with opportunity for practice of this process. Meetings in homes and community centers to see how different families and groups of people manage to achieve their individual purposes. Cooperation with families in the solution of home management problems. Individual projects. Fee, \$6.

E 320. *MANAGEMENT ASPECTS OF HOUSEHOLD EQUIPMENT*... Graduate; credit two hours. Discussions, laboratory, and field trips, T Th 2-5. Assistant Professor REMSBERG.

The management involved in selection, use, care, and repair of household equipment for the home or school. Variation in design and quality in relation to the individual situation. Trips to homes where certain equipment is being used. Discussions with homemakers, distributors, and others. Fee, \$2.

FOOD AND NUTRITION

E 250. *FOOD PRESERVATION*... Graduate and undergraduate; credit two hours. Registration by permission. Discussion, M W F 8. Room 339. Laboratory, T Th 8-10:20. Professor FENTON.

Emphasis on frozen foods. Canning, dehydrating, salting, pickling, and jelly making also included. The hows and whys of each method and the comparative retention of nutritive values. Fee, \$8.

E 300. *SPECIAL PROBLEMS*... Graduate; credit and hours to be arranged. Registration by permission. Department Staff.

Independent advanced work on a problem not dealt with by other courses in the department. Fee determined by the problem.

E 310B. *APPLICATION OF RESEARCH FINDINGS TO PROBLEMS OF FOOD PREPARATION*... Graduate and undergraduate; credit two hours. Prerequisite, courses in chemistry and in food preparation satisfactory to the instructor. Lecture and discussion, T Th 10:30-12. Laboratory, W F 10-12:20. Professor PFUND.

Colloidal systems from the point of view of the importance of foams and emulsions in food preparation; the chemistry of carbonates and baking powders and their use in baked products; the qualities of flours and fats of importance in baked products; palatability of foods.

Laboratory work will include the preparation and comparison of such products as yeast breads, quick breads (biscuits, muffins, and steamed breads), steamed puddings, cookies, shortened and unshortened cakes, mayonnaise, whipped cream, meringues, and souffles. The effects of varying manipulation, ingredients, and cooking conditions will be studied. Fee, \$10.

Courses E 310A, B, and C will be offered in consecutive years; together they cover the general field of science and recent research related to food preparation. The courses may be taken in any order and they, or their equivalent, are prerequisite to experimental cookery, E 320.

E 345. *APPLICATION OF NEWER KNOWLEDGE IN NUTRITION TO FAMILY FOOD PROBLEMS*... Graduate or undergraduate; credit two hours. Prerequisite, some college work in physiology, organic or biochemistry, and nutrition. Lecture and discussion, daily except Saturday 2. Professor HAUCK.

A survey course planned for students who wish to bring up-to-date their knowledge of nutrition. Fee, \$2.

E 345A. *RECENT DEVELOPMENTS IN NUTRITION AND THEIR RELATION TO FAMILY PROBLEMS* (See EXTENSION EDUCATION).

E 415. *RECENT RESEARCH IN NUTRITION*... Graduate; credit one hour. Sponsored jointly with the School of Nutrition. Prerequisite, some college work in physiology, organic or biochemistry, and nutrition. Lecture, M W F 9. Professor HAUCK in charge.

Lectures by members of the Cornell University Faculty in nutrition, biochemistry, physiology, and medicine. Fee, \$1.

E 420B. *ADVANCED SEMINAR IN FOOD*. . . Graduate; credit one hour. Registration by permission of the instructor. M W 10. Professor FENTON.

Emphasis on the critical data on which the principles of food preparation are based. Critical review of current literature in this field. Fee, \$1.

HOME ECONOMICS EDUCATION

For all courses in Home Economics Education see EDUCATION.

HOUSING AND DESIGN

E 302. *REFRESHER COURSE IN COLOR AND DESIGN APPLICATIONS*. . . Graduate and undergraduate. Credit two hours. Prerequisite, some professional experience or elementary course work in Color and Design. Laboratory work, lectures, outside reading; laboratory, T Th 9-12; lecture, Th 12. Associate Professor VIRGINIA PHILLIPS OGDEN.

Review of basic principles of color and design with laboratory application problems. Fee, \$8.

E 310. *STUDY OF ROOMS, SELECTION AND ARRANGEMENT OF FURNISHINGS*. . . Graduate and undergraduate; credit two hours. No prerequisite, previous study of color and design desirable. Laboratory work, lectures, outside reading. Laboratory, T Th 2-5; lecture, T 12. Associate Professor OGDEN.

The relation of furnishings to the architectural features of rooms. Functional arrangement and design of furnishings. Selection and arrangement of furnishings in relation to family needs. Fee, \$8.

E 316. *HOUSE PLANNING* (Two sections). . . Graduate and undergraduate; credit two hours. No prerequisite. Drafting room work, lectures, local trips, outside reading. M W F 8-11; M W F 2-5. Assistant Professor BAIRD.

Introductory course in comprehensive home planning, incorporating house, landscape, and neighborhood. Elementary design problems in space arrangement and construction. Discussion of typical and new construction methods, and prefabrication. Fee, \$8.

E 330. *RURAL HOUSING* (see EXTENSION EDUCATION).

INSTITUTION MANAGEMENT

E 220. *FOOD SELECTION AND PURCHASE FOR THE INSTITUTION*. . . Credit 2 hours. Graduate and undergraduate. May follow or parallel Quantity Cookery. T Th 9-10, Th 2-4. Professor HARRIS.

A discussion of sources, grading, standardization, bases of selection, methods of purchase and storage of various classes of food. Fee, \$1.00.

E 230. *QUANTITY COOKERY*. . . Credit three hours. Graduate and undergraduate. Registration by permission of instructor. Prerequisites: elementary course in institution management, nutrition and food preparation. Discussion and laboratory, M W F 8-1. Assistant Professor CUTLAR.

Quantity preparation of the major foods for the Home Economics Cafeteria where approximately 2500 persons are served each day; use, operation, and care of institution cooking equipment; observation of management and personnel problems; menu planning and recipe costing. The student is expected to apply basic principles and procedures of food preparation, food chemistry, marketing, and nutrition. Fee, \$10.

E 300. *SPECIAL PROBLEMS*...Credit one or two hours. Credit and hours to be arranged individually. Graduate registration by permission of Professor HARRIS.

Independent advanced work on a problem not dealt with by other courses in the department. Fee determined by the problem.

E 410. *SEMINAR IN INSTITUTION MANAGEMENT*. Credit one hour. For graduate students with adequate training in institution management. Registration by permission of the instructor. T 2-4. Professor HARRIS.

A review of current problems and research in the field of food administration.

TEXTILES AND CLOTHING

E 120. *PROBLEMS IN GROOMING: CARE AND RENOVATION OF CLOTHING*...Graduate and undergraduate; credit two hours. Daily except Saturday 2-4. Associate Professor BUTT.

A course planned to give teachers an opportunity to study and evaluate subject matter in this field; to develop skill in grooming techniques and in the renovation of wearing apparel.

Laboratory will consist of demonstrations, discussions, and practice of grooming techniques needed in teaching, evaluation of the types of cosmetics and other grooming aids, and of methods and materials of keeping clothing wearable.

The problems emphasized will be determined by the needs of the group. Fee, \$5.

E 130. *TEXTILES: CLOTHING FABRICS*...Graduate; credit two hours. Daily except Saturday 11-1. Associate Professor BUTT.

A study of textile fibers and their identification through simple laboratory tests; technical information and laboratory practice to develop good buying habits and to encourage proper use and care of fabrics and clothing; consideration of some of the factors involved in the production and consumption of textiles; the study of clothing fabrics in the present-day market as a means of developing aesthetic appreciation of quality and design. Depending upon the experience and interest of students registered special phases of textile subject matter may be developed. Estimated cost of materials, \$3. Fee, \$5.

E 200B. *DRAPING*...Graduate (undergraduates by permission of instructor); credit two hours. Daily except Saturday 2-4. Assistant Professor STALEY.

A course planned to give teachers and others a better understanding of the principles of fitting, skill in handling fabrics, and an introduction to this method of creative dress designing.

Laboratory problems will include the preparation of individual dress forms; practice in developing original designs through draping; and the draping of two garments, one of which is carried through to completion. Materials to be provided by students at an estimated cost of \$16 to \$25. Fee, \$5.

E 210. *DRESS SELECTION AND DESIGN*...Graduate (undergraduates by permission of instructor); credit two hours. Daily except Saturday 11-1. Associate Professor FROST.

A course planned to give opportunity for creative experience and to help develop appreciation of fine design and skill in achieving beauty of costume in relation to the wearer.

Laboratory practice includes the study of design problems from points of view of personality expression, age, coloring, and figure; experimentation with fabric combinations; color analysis; experience in the use of source material as inspiration for designing and restyling clothes; other problems adapted to the needs and interests of the students. Materials to be provided by the student. Estimated cost of materials, \$5. Fee, \$5.

E 325. *TAILORING*...Graduate (undergraduates by permission of the instructor); credit two hours. Daily except Saturday 8-10. Assistant Professor STALEY.

Laboratory problems will include the making of a wool coat or suit with emphasis on the techniques of tailoring as they apply to construction problems in dressmaking. Materials provided by students. Estimated cost of materials, \$20 to \$30. Fee, \$5.

E 430. *SEMINAR IN TEXTILES AND CLOTHING*...Graduate; credit two hours. T Th 7-8:30 p.m. Associate Professor FROST.

Planned to give opportunity for study of the current problems in textiles and clothing which are not considered in the courses listed above. Reading, lectures by guest lecturers, and discussion.

Special emphasis will be placed on social-economic aspects of clothing and a survey of research problems carried on by graduate students here and in other universities.

HOTEL ADMINISTRATION

In 1922 Cornell University established, with the cooperation and financial assistance of the American Hotel Association, a four-year course in Hotel Administration for high school graduates desiring to enter the administrative departments of the hotel business. Many hotel proprietors and managers, who have been unable to take a four-year university course, have asked for shorter courses with less formal entrance requirements.

To meet this demand, much of the Summer Session work in Hotel Administration is given in unit courses, one to three weeks in length. A circular giving full details of these courses has been issued and will be sent upon request. For this circular, for other information about the work in this department, and for admission to these courses, address Professor H. B. MEEK, *Martha Van Rensselaer Hall, Cornell University, Ithaca, N. Y.*

ENGINEERING

ENGINEERING ADMINISTRATION

S 3231. *PRINCIPLES OF INDUSTRIAL ACCOUNTING AND COST FINDING*...Undergraduate and graduate; credit three hours. Recitation, daily except Saturday 9 or 12; Laboratory, M or T 2-4:30 and Th or F 2-4:30. Associate Professor WHITE.

A basic course in modern industrial accounting and in cost finding.

S 3235. *INDUSTRIAL ORGANIZATION AND MANAGEMENT*...Undergraduate and graduate; credit three hours. Section 1, daily 9 and W 1-2:30. Section 2, daily 10 and T 2:30-4. Assistant Professor SAMPSON.

Lectures, discussion, problems, and collateral reading. An elementary survey of problems of management in industrial organization, with emphasis on factory management.

S 3241. *ELEMENTARY INDUSTRIAL STATISTICS*...Undergraduate and graduate; credit three hours. Prerequisite, Calculus 60b. Recitation, daily except Saturday 10; laboratory, M and Th 2-4:30. Professor LOBERG.

An elementary course in statistical analysis covering frequency distribution, measures of dispersion, probability, measures of reliability, time series, index numbers, and simple correlation as applied to engineering and industrial problems.

D 3247. *PRINCIPLES OF COST CONTROL*...Undergraduate and graduate; credit three hours. Prerequisite, course 3A31 or its equivalent. Recitation, daily except Saturday 12; laboratory, M and Th 2-4:30. Associate Professor SCHULTZ.

This course covers in detail, through work in the laboratory, manufacturing cost systems for job orders and for continuous processes. Budgets and statements are discussed.

MACHINE DESIGN

S 3337. *MACHINE DESIGN, RECITATIONS*... Undergraduate and graduate; credit three hours. Prerequisite, courses 3D25, 3D26, 3T22, 3S23 and 3M22a. Daily 8 and T 1-2:30. Assistant Professor HINKLE.

The theoretical and practical applications of kinematics, materials, mechanics, and technology of the design of machines and machine elements with due regard to such considerations as suitability of materials, safety, lubrication, construction, etc.

S 3423. *MACHINE TOOL PROCESSES*... Undergraduate and graduate; credit two hours. Prerequisites, Casting Processes, 3401 and 6112, or their equivalent. Open only to Electrical and Mechanical Engineering students. Associate Professor GEER.

MECHANICAL LABORATORY

S 3640. *INTRODUCTORY MECHANICAL LABORATORY*... Undergraduate and graduate; credit three hours. M or T 1-4:30 and Th or F 1-4:30. Associate Professor ERDMAN.

For those who have studied the properties of steam or are starting to do so. Eight experiments selected from the following: temperature measurement, pressure measurement and control, steam calorimetry, indicators and planimeters, fluid flow, flue gas analysis and boiler water conditioning, dynamometers, hydraulics flow measurements, steam engine, carburetion and ignition.

MECHANICS

S 1111. *THEORETICAL AND APPLIED MECHANICS*... Undergraduate and graduate; credit five hours. Prerequisites, passing grades in Mathematics 55a and 55b or in 60a and 60b. Daily 8 and 11. Associate Professor PERKINS.

Principles of Statics: forces and couples in a plane and in space; virtual displacements; applications to structures and mechanisms. Principles of Dynamics: analysis of translational and rotational motion of particles and rigid bodies; velocity, acceleration, momentum, impulse, work and energy, with engineering applications.

S 1112. *STRENGTH OF MATERIALS*... Undergraduate and graduate; credit three hours. Prerequisite, course 3M21. Daily 8 and T 1-2:30. Mr. CRANCH.

Stress, strain; strength and elastic properties of materials in tension, compression and shearing; riveted joints; torsion of shafts; helical springs; shear, moment, safe loading, and deflection of simple beams; special beams; eccentric loads; columns; impact loads.

S 1114. *APPLIED MATHEMATICS*... Undergraduate and graduate; credit three hours. Prerequisite, course 3M21. Daily 9 and F 1-2:30. Mr. CRANCH.

Manipulation of data and reduction to empirical equations; elementary differential equations and applications to a variety of engineering problems, including free and forced vibration of the simpler mechanisms and structures.

HEAT POWER

S 3535. *HEAT-POWER ENGINEERING*... Undergraduate and graduate; credit three hours. Prerequisites, 3D25, 3D26, 3M21, or other equivalent. Daily 11 and F 2:30-4. Associate Professor Hook.

Basic thermodynamics of gases and vapors; ideal cycles and their application in air compressors, internal-combustion motors, steam engines and turbines; efficiencies and performances.

S 3536. *HEAT-POWER ENGINEERING*... Undergraduate and graduate; credit three hours. Prerequisite, 3P35 or its equivalent. Daily 12 and W 2:30-4. Associate Professor CONTA.

Flow of fluids through nozzles, orifices, and turbines; steam-turbine types, and their applications; heat transfer; fuels; combustion; steam-generating units; exit gas analysis; furnaces; boilers; stokers and other fuel-burning equipment.

S 3581. *INTERNAL-COMBUSTION ENGINES*... Undergraduate and graduate; credit three hours. Prerequisites, 3P35 and 3P36 or their equivalent. Daily 9 and T 2:30-4. Assistant Professor GAY.

The principles of operation of spark- and compression-ignition, internal-combustion engines and their auxiliaries; petroleum fuels and their properties; combustion; detonation and octane rating; engine cooling, rating, and performance; supercharging of aircraft and compression-ignition engines; gas turbine cycles.

S 3588. *REFRIGERATION AND AIR CONDITIONING*... Undergraduate and graduate; credit three hours. Prerequisites, 3P35, 3P36, or their equivalent. Recitation daily except Saturday 10; laboratory, M or T 2-4:30 and Th or F 2-4:30. Mr. TRACY.

The general principles of refrigeration with particular emphasis on the equipment; principles and practice in the conditioning of air, including cooling, heating, dehumidifying, and ventilating; application of refrigeration in cold storage.

ENGINEERING MATERIALS

S 1221. *ENGINEERING MATERIALS*... Undergraduate and graduate; credit three hours. Prerequisites, Chemistry 102a, b or 104a, b. Daily 11 and W 2:30-4. Professor JEFFREY.

An elementary lecture course in Engineering Materials covering metallurgy of iron and steels, alloy steels, non-ferrous metals and alloys.

S 1222. *ENGINEERING MATERIALS*... Undergraduate and graduate; credit three hours. Prerequisite, 3T21. Daily at 10 and W 1-2:30. Professor JEFFREY.

An elementary lecture course in Engineering Materials covering corrosion, fuels and their combustion, refractories, cementing materials and concrete, wood, rubber, plastics, lubricants, and the testing and inspection of materials.

S 1231. *ENGINEERING MATERIALS LABORATORY—METALS AND ALLOYS*... Undergraduate and graduate; credit three hours. Prerequisites, 3T21, 3M21, 3M22a. M or T 1-4:30 and Th or F 1-4:30. Professor MOYNIHAN.

A laboratory course dealing with materials testing and the properties of metals and alloys. The following types of tests with testing machines and auxiliary apparatus will be performed: tension, torsion, compression of blocks and columns, bending, impact, fatigue, hardness and ductility. The relation between the properties, structure, selection, inspection and use of metals and alloys will be shown by the following experiments: carbon steels, cast irons, heat treatment, metal processing, non-ferrous metals and alloys, and metallography.

S 1232. *ENGINEERING MATERIALS LABORATORY—NON-METALLIC MATERIALS*... Undergraduate and graduate; credit three hours. Prerequisite, 3T22 or 3T31. M or T 1-4:30 and Th or F 1-4:30. Professor MOYNIHAN.

A laboratory course dealing with the properties, selection and use of the following non-metallic materials: oils and lubricants, fuels (solid, liquid, and gaseous) and combustion, plastics, wood, cementing materials and concrete.

CIVIL ENGINEERING

S 220. *MECHANICS*... Undergraduate; credit five hours. Prerequisite, Mathematics 55b or 60b. Daily 8 and 11. Professor CHENEY.

Statics, methods of analysis; centers of gravity and moments of inertia; kinetics and dynamics; friction, work, and power; impact, impulse, and momentum.

S 220B. *MECHANICS*... Undergraduate; credit one hour. To be taken concurrently with S 220. M F 1:40-4:30. Professor CHENEY.

Problems in mechanics.

S 221. *MECHANICS*... Undergraduate; credit four hours. Prerequisite, Mechanics 220 or equivalent. Daily except Saturday 8 and 11. Professor ANTONI.

Mechanics of materials; stress, strain, tension, shear, compression, flexure; elastic curves; columns.

S 221B. *MECHANICS*... Undergraduate; credit one hour. To be taken simultaneously with S 221. T Th 1:40-4:30. Professor ANTONI.

Problems in mechanics of materials.

S 223. *ENGINEERING PROBLEMS*... Undergraduate; credit two hours. Prerequisite, 221 and 240. M W F 1:40-4:30. Professor ANTONI.

Problems in ordinary engineering practice.

S 225. *MATERIALS OF CONSTRUCTION*... Undergraduate; credit three hours. Prerequisite, 221. Daily 8. Professor SCOFIELD.

A study of the properties, use, testing, strength, of lime, cement and concrete, stone, brick, sand, timber, iron, and steel, other materials.

S 226. *TESTING OF MATERIALS*... Undergraduate; credit three hours. M T Th F 1:40-4:30. Professor SCOFIELD.

Testing of materials studied in 225.

S 270. *STRESS ANALYSIS*... Undergraduates; credit four hours. Daily 8; M W 1:40-4:30. Professor BURROWS (Civ.); Professor GRISET (Army).

Analysis of beams, and structural frames. Shears and moments. Stresses due to dead, live, impact and wind loads. Design of a timber truss.

S 271. *STRUCTURAL DESIGN*... Undergraduate; credit three hours. Daily 9-11:30. Professor BURROWS.

An elementary course in steel design. Principles of riveted and welded construction.

S 273. *STEEL BUILDINGS*... Undergraduate and graduate; credit three hours. Daily 9-11:30. Professor BURROWS.

Design of the steel framework for buildings used in industry.

S 280. *CONCRETE CONSTRUCTION*... Undergraduate; credit three hours. Daily 9-11:30. Professor MAINS.

Properties of plain and reinforced concrete. Elementary theory of reinforced concrete beams, slabs, columns, and footings.

S 281. *FOUNDATIONS*... Undergraduate; credit three hours. Daily 3. Professor MAINS.

The various methods of design and construction of foundations; piles, caissons, piers, abutments; building foundations and underpinning; soil mechanics.

S 285. *REINFORCED CONCRETE DESIGN*... Undergraduate and graduate; credit three hours. Daily except Saturday 1:40-4:30. Professor GRISET.

Design of footings, grillages, columns, bins, tanks, walls.

S 291F. *WOOD CONSTRUCTION*... Undergraduate and graduate; credit three hours. Daily 9-11:30. Professor BURROWS.

The design of wood structures in dimensioned timber and laminated construction.

S 252. *SEWERAGE*... Undergraduate; credit three hours. Prerequisite, 240. Daily except Saturday 8; M F 1:40-4:30. Professor GIFFT.

Design of sanitary and of storm sewers. Treatment of sewage. Problems.

S 253A. *WATER SUPPLY AND TREATMENT*... Undergraduate; credit three hours. Prerequisite, 240. Daily except Saturday 9; W 1:40-4:30; S 9-12. Professor GIFFT.

Collection, distribution, and treatment of water for domestic and industrial use.

S 265. *HIGHWAY ENGINEERING*... Undergraduate; credit three hours. Prerequisite, 287 and 260B. Daily except Saturday 9; M F 1:40-4:30. Professor BELCHER. Design of streets and highways, subgrades, stabilization, drainage, construction of pavements. Tests of highway materials.

S 266, 267. *HIGHWAY ENGINEERING LABORATORY*... Undergraduate and graduate; credit three hours each. T W Th 1:40-4:30. Professor BELCHER. Tests of highway materials. Soil stabilization experimentation.

ELECTRICAL ENGINEERING

S 4935. *FUNDAMENTALS OF ELECTRICAL ENGINEERING: THEORY* . . . Undergraduate; credit three hours. Daily 8, T Th 10. Professor ERICKSON and staff. Fundamentals of electrical engineering theory. Required of fifth term students in Electrical Engineering and Administrative Engineering. D.c. electric and magnetic currents, principles of d.c. motors, generators and control equipment; electrical power distribution; simple a.c. circuits.

S 4936. *FUNDAMENTALS OF ELECTRICAL ENGINEERING: THEORY* . . . Undergraduate; credit three hours. Lecture, daily 9; recitation, T Th 11. Professor ERICKSON and staff.

Fundamentals of electrical engineering theory. Required of sixth term students in Mechanical Engineering and Administrative Engineering.

S 4937. *FUNDAMENTALS OF ELECTRICAL ENGINEERING: LABORATORY* . . . Undergraduate; credit one hour. Offered in connection with course S 4935. M T or W 1:40-4:30, and Th F 1:40-4:30 or S 10-1. Professor ERICKSON and staff.

S 4938. *FUNDAMENTALS OF ELECTRICAL ENGINEERING: LABORATORY* . . . Undergraduate; credit one hour. Offered in connection with course S 4936. M T or W 1:40-4:30, Th F 1:40-4:30 or S 10-1. Professor ERICKSON and staff.

S 4111. *BASIC ELECTRICAL ENGINEERING*... Undergraduate; credit four hours. Lecture, T Th 9; recitation, daily except Saturday 11; computing, M Th 1:40-4:30. Professor STRONG and staff.

Conductors and resistance; electrical measuring instruments; resistance measurement; electromagnetic induction; alternating emf; power distribution circuits; d.c. electrical networks and methods of solution; conductors of nonuniform section or material; mapping of current paths; magnetics, magnetic circuits and forces; electromagnets; self and mutual inductance, coupling, reactors; electrostatic energy, fields and forces; capacitance; transient and alternating currents in circuits with resistance, and inductance and capacitance.

S 4116. *ELECTRICAL CIRCUIT LABORATORY*... Undergraduate; credit three hours. M T or W 1:40-4:30 and Th F 1:40-4:30 or S 10-1. Professor BURCKMYER and staff.

A laboratory course normally following course 4111, and intended to stress the laboratory principles and practice of topics related to this material.

EDUCATION

ADMINISTRATION AND SUPERVISION

A 260a. *THE ADMINISTRATION OF SECONDARY SCHOOLS*... Undergraduate and graduate; credit two hours. Daily except Saturday 8. Mr. SCHULTZ.

A consideration of problems in the administration of a secondary school.

A 260b. *THE ADMINISTRATION OF THE ELEMENTARY SCHOOL*... Undergraduate and graduate; credit two hours. Daily except Saturday 12. Mr. SCHULTZ.

Intended primarily for persons seeking an elementary principal's certificate.

A 261a. *FUNDAMENTALS OF EDUCATIONAL ORGANIZATION AND ADMINISTRATION*...Graduate; credit two hours. Daily except Saturday 10. Professor REUSSER.

A consideration of the more important problems in organizing and administering the community's educational program.

A 262a. *SCHOOL FINANCE*...Graduate; credit two hours. Daily except Saturday 8. Professor REUSSER.

Typical problems: how local school funds are levied, collected, and disbursed; cost accounting; budget making; bonding; sources of state funds and their distribution. The discussion is based upon actual problems; prospective members of the class are urged, therefore, to bring with them financial data regarding their schools.

A 263. *PROCEDURES AND TECHNIQUES IN SUPERVISION*...Graduate; credit two hours. Daily except Saturday 9. Professor MOORE.

Designed for superintendents, supervisors, and principals. Inexperienced students admitted only by permission. A consideration of the nature and purpose of supervision; the improvement of the learning-teaching process; skill in observations; analysis of methods; relationships between general and specific objectives; selection, analysis, and organization of subject matter; measuring and testing results; assisting teachers in professional growth.

A 266. *THE SUPERVISION OF THE ELEMENTARY SCHOOL*...Graduate; credit two hours. Daily except Saturday 11. Professor MOORE.

Designed for supervisors, elementary school principals, and superintendents. A consideration of important research studies which have a direct bearing upon the teaching and supervisory problems of the elementary school.

A 262c. *THE SCHOOL PLANT*...Graduate; credit two hours. Daily except Saturday 11. Professor BUTTERWORTH and specialists.

A workshop especially planned for administrative officers who expect to face building problems within the next few years. As a means of making the workshop activities realistic, members of the class should, if possible, bring with them certain basic data regarding their situations. Write the instructor for a statement of the types of data desired. An architect and other specialists will be available for assisting with technical details.

The workshop will deal with the principles and techniques of planning a school building to house the community's educational program. Typical problems: evaluating a school plant; predicting pupil population; school-community relationships affecting the school building; determining needs for class and special rooms; preparing preliminary plans for the architect; new type of building materials and equipment; measuring probable utilization.

Since registration is limited, early application for admission to the Workshop is desirable; address Professor JULIAN BUTTERWORTH, Stone Hall.

A 264. *SEMINAR IN SCHOOL ADMINISTRATION*...Graduate; credit two hours. Daily except Saturday 9. Professor BUTTERWORTH.

A study of the intermediate district in New York State: lacks in the educational program in rural areas; various methods of meeting these needs; the socio-economic concept in laying out an intermediate district; organizing and financing the proposed district; the Area School; etc. Data from the Intermediate District Study are available for analysis.

A 262f. *THE LEGAL PROBLEMS OF THE SCHOOL ADMINISTRATOR*...Graduate; two hours. Daily except Saturday 10. Mr. ESMOND.

An analysis of representative problems in school administration having legal implications, with a discussion of the principles of law that are involved.

AGRICULTURAL EDUCATION

A 133. *THE TEACHING OF AGRICULTURE*... Undergraduate; credit to be arranged. Daily except Saturday 9. Staff in Agricultural Education.

Consideration of problems in teaching to meet special or additional needs of students. Credit may count toward fulfilling certification requirements.

A 232. *EVALUATION AND PROGRAM PLANNING IN AGRICULTURAL EDUCATION*... Graduate; credit two or three hours. W 1-5 and one hour to be arranged. Associate Professor HOSKINS.

The evaluation of programs of vocational education in agriculture in actual situations as a basis for effective planning.

A 233b. *SUPERVISED FARMING PROGRAMS IN VOCATIONAL AGRICULTURE*... Graduate (undergraduates by special permission); credit two hours. M T 10, T 1-5. Associate Professor OLNEY.

Field studies in nearby schools with summarizing conference periods on improvement of programs of supervised farming.

A 234. *ADULT EDUCATION*... Graduate (undergraduates by special permission); credit two hours. Daily except Saturday 11. Associate Professor HOSKINS.

Designed for leaders of adult groups of the several age, educational, and occupational levels. The use of community councils in planning comprehensive adult programs and activities, based upon area resources and needs.

A 250. *SEMINAR IN AGRICULTURAL EDUCATION RESEARCH*... Graduate; credit two hours. Daily except Saturday 8. Associate Professor OLNEY.

Study of current literature and studies in agricultural education, reports on findings, evaluation of techniques used with applications to studies needed and procedures for development.

THE CURRICULUM

S 30. *THE TEACHING OF THE SOCIAL STUDIES IN SECONDARY SCHOOLS*... Graduate; credit two hours. Daily except Saturday 8. Miss KLEE.

A practical consideration of teaching and evaluation procedures in relation to materials of instruction and activities of pupils.

S 33. *THE TEACHING OF ENGLISH IN SECONDARY SCHOOLS*... Graduate; credit two hours. Daily except Saturday 8. Miss GRIMES.

A course designed to help inexperienced and experienced teachers with methods and materials for teaching literature and composition. Emphasis placed on that phase of English which is of most interest to the class.

S 130. *SEMINAR IN PROBLEMS OF TEACHING SOCIAL STUDIES IN SECONDARY SCHOOLS*... Graduate; credit two hours. Daily except Saturday 1. Miss KLEE.

The study and development of curriculum materials. Members of the class will have access to a curriculum laboratory and the opportunity to work on individual projects.

S 133. *SEMINAR IN PROBLEMS OF TEACHING ENGLISH IN SECONDARY SCHOOLS*... Graduate; credit two hours. Daily except Saturday 1. Miss GRIMES.

A seminar to assist experienced teachers who are working upon some problem pertaining to the teaching of English in the secondary school.

S 140. *NEWER TRENDS IN EDUCATION AS APPLIED TO THE ELEMENTARY SCHOOL*... Graduate; credit two hours. Daily except Saturday 11. Assistant Professor JUNGE.

A consideration of recent trends in elementary school education.

S 147a. *IMPROVING READING IN THE MODERN CURRICULUM*... Graduate; credit two or four hours. Daily except Saturday 11; additional laboratory hours to be arranged for students taking the course for four hours credit.

A course planned for teachers, supervisors, and administrators who wish to develop reading programs in the upper elementary and secondary levels of their schools, and who are interested in the developments in the field. Remedial reading considered in relationship to the total reading program. New texts and materials examined. Some time devoted to examination and evaluation of reading tests now in use. Techniques considered practicable in everyday school situations presented through demonstration or description. Students taking the course for extra credit may study individual problems dealing with the identification and correction of reading difficulties or plan a program for a specific school situation.

S 224. *METHODS AND MATERIALS OF INSTRUCTION IN THE ELEMENTARY SCHOOL*... Graduate; credit two hours. Daily except Saturday 9. Assistant Professor JUNGE.

Designed for teachers, supervisors, elementary school principals, and superintendents. A consideration of important research studies which have a direct bearing upon the teaching and supervisory problems of the elementary school.

A 276d. *MAJOR PROBLEMS AND TRENDS IN CURRICULUM BUILDING TODAY*... Graduate; credit two hours. Daily except Saturday 10. Assistant Professor KING.

A consideration of some of the recent major trends in determining curriculum objectives, content, and organization in elementary and secondary schools today; and the interpretations of education, its nature, and purposes forming the basis of those trends. Special attention will be given to significant problems of curriculum building in the light of existing theories and practices and emerging demands for readjustment. Some opportunity will be offered for work and consultation on individual problems.

A 281c. *PROBLEMS AND TRENDS IN THE REDIRECTION OF SECONDARY EDUCATION*... Graduate; credit two hours. Daily except Saturday 12. Assistant Professor KING.

A consideration of selected recent trends in the conception of secondary education in the United States today as to its scope, aims, functions, organization, curricula, its adjustment to the needs of American youth and the demands of his social, economic, cultural, and spiritual environment. Attention will be given to some of the major problems that must be met in effecting the needed changes.

EDUCATIONAL PSYCHOLOGY

S 7. *MENTAL MEASUREMENTS*... Undergraduate and graduate; credit three hours. With consent of the instructor, this course may be taken without observations for two hours credit. Daily except Saturday 9; observation hours to be arranged. Professor FREEMAN.

Concepts of intelligence; individual and group tests of intelligence; principles underlying their construction and interpretation; use of tests in schools, in the armed services, and in other fields. Lectures, readings, and observations of individual testing.

S 12. *PSYCHOLOGY OF EXCEPTIONAL CHILDREN*... Graduate (undergraduates by special permission); credit two hours. Daily except Saturday 11. Professor FREEMAN.

Designed to give a scientific understanding of children who deviate from the usual: the gifted, the feeble-minded, the delinquent, those having special abilities or disabilities, those having personality defects and those having sensory and physical handicaps. Lectures, reading, and case studies. Students who have not had or are not now taking a course in mental measurements may be admitted only with approval of the instructor.

A 116. *CHILD PSYCHOLOGY*... See *PSYCHOLOGY*.

A 214a. *THE DISCOVERY AND PREVENTION OF DELINQUENCY*... Undergraduate and graduate; credit two hours. Daily except Saturday 11. Mr. CROWE and Mr. HALPIN.

Current data on delinquency, with emphasis on techniques and programs for its discovery and prevention.

A 215. *PSYCHOLOGY OF ADOLESCENCE*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Mr. CROWE and Mr. HALPIN.

A study of behavior during the adolescent stage of development.

A 251. *EDUCATIONAL MEASUREMENT*... Graduate; credit two hours. Daily except Saturday 8. Assistant Professor BAYNE.

The use and interpretation of tests by teachers and school officers as aids in the improvement of instruction.

GUIDANCE AND PERSONNEL ADMINISTRATION

S 118. *EXTRA-CLASS EDUCATION OF PUPILS*... Graduate (undergraduates by permission); credit two hours. Daily except Saturday 9. Professor ALLEN and Miss FREDERICK.

Consideration of supervision of such extracurricular activities as the student council, the group problem, publications, and home rooms. Attention to developing a philosophy concerning student participation in government and to clarifying the relationship between students and administration.

A 119. *PERSONNEL ADMINISTRATION*... Graduate; credit two hours. Daily except Saturday 10. Professor WINSOR.

A study of the problems of human management and industrial relations in business and industry. The principles and methods of recruitment, selection, placement, maintenance, organization, and government of employees are considered from the point of view of the personnel director and the guidance counselor.

A 217. *USE AND INTERPRETATION OF TESTS IN GUIDANCE*... Graduate; credit two hours. Daily except Saturday 8. Professor WINSOR.

This course deals with the development, use, interpretation, and significance of psychological measuring devices as a basis for analyzing the capacities, interests, and abilities of individuals seeking vocational guidance. A course in measurement is prerequisite.

S 280. *STUDENT PERSONNEL ADMINISTRATION IN COLLEGES AND UNIVERSITIES*... Graduate; credit two hours. Daily except Saturday 11. Professor ALLEN.

The scope, organization, and development of a student personnel program. Discussion of specific areas by visiting lecturers. Consultation on specific problems brought from particular schools. Designed to assist personnel officers and school and college administrators.

A 282. *EDUCATIONAL AND VOCATIONAL GUIDANCE*... Graduate; credit two hours. Daily except Saturday 9. Assistant Professor NELSON.

Primarily for graduate students who wish to become certified as counselors. Principles and practices of educational and vocational guidance. Historical and theoretical background of the guidance movement; educational, vocational, and community information needed; the study of the individual; group methods; counseling; placement and follow-up; the organization, administration, and appraisal of guidance programs.

A 282a. *WORKSHOP IN GUIDANCE FOR RURAL SCHOOL ADMINISTRATORS*... Graduate; credit two hours. Daily except Saturday 8. Assistant Professor NELSON.

Problems peculiar to the organization of guidance programs in rural areas. Practical tools, techniques, and procedures that may be safely utilized without the employment of specialists. Consultation on difficulties encountered in the school systems in which members of the class work. Discussion of specific areas by visiting lecturers.

A 283. *COUNSELING METHODS*... Graduate; credit four hours. Daily except Saturday 9-11. Prerequisite, 282 or equivalent. Mr. LAFORTUNE.

Primarily for graduate students who wish to become certified as counselors. Techniques for counseling with individuals concerning various kinds of educational, vocational, and social adjustment problems.

A 284. *THE TEACHING OF OCCUPATIONS AND ORIENTATION CLASSES*... Graduate; credit two hours. Daily except Saturday 10. Assistant Professor NELSON.

Methods and materials for presenting occupational and orientation information to students. Deals with classes in occupations, orientation groups, field trips, clubs, work-experience programs and other media.

A 285. *OCCUPATIONAL AND EDUCATIONAL INFORMATION*... Graduate; credit four hours. Daily except Saturday 11. Hours for field trips to be arranged. Prerequisite, permission of instructor. Mr. CORVINI.

Survey and appraisal of occupations and training opportunities; study of sources of educational and vocational information; job analysis; vocational trends; field trips to places of employment.

HOME ECONOMICS EDUCATION

*E 436b. *METHODS WORKSHOP IN FAMILY RELATIONSHIPS FOR TEACHERS OF HOME ECONOMICS*... Graduate; credit three hours. July 1-19. Full time. Professor THURSTON and Dr. MCGINNIS.

Afternoon sessions will be spent in discussing pertinent problems of high school students and adults in family relationships. The morning workshop sessions will discuss ways of developing curriculum materials in this area. Each student will prepare a plan for teaching family relationships in her own school.

E 437. *ADULT HOMEMAKING EDUCATION*... Graduate; credit two or three hours. Daily except Saturday 10. Assistant Professor PATTERSON.

Designed for teachers, nutritionists, extension agents, health and social workers, and other leaders in adult homemaking education. This course deals with philosophy, organization, administration, program planning, promotion, leadership, teaching methods, and evaluation of adult programs. Attention is given to the contributions which different agencies can make to adult education in the community program.

*E 438. *FAMILY LIFE EDUCATION IN COMMUNITY PROGRAMS*... Graduate; credit two or three hours. Daily except Saturday 9. Field experience, ten hours each week. July 1 to 19 inclusive. Dr. MORGAN.

Designed for teachers, supervisors and others who participate in parent education or other adult educational programs of family living.

E 448. *TEACHER EDUCATION IN HOME ECONOMICS*... Graduate; credit two hours. Daily except Saturday 10. Assistant Professor MOSER.

Planned for cooperating teachers participating in teacher education programs and for experienced teachers who desire to prepare for positions in the field of teacher education.

E 449a. *SEMINAR IN HOME ECONOMICS EDUCATION: CURRICULUM*... Graduate; credit two hours. Daily except Saturday 8. Assistant Professor MOSER.

Designed for graduate students who have had experience in teaching home economics in schools, colleges, and extension service. Students may arrange to work on individual problems.

E 449b. *SEMINAR IN RESEARCH IN HOME ECONOMICS EDUCATION*... Graduate; credit two hours. Daily except Saturday 11. Professor THURSTON.

For graduate students with experience and background in Home Economics Education. Consideration will be given to problems requiring investigation, to methods appropriate for studies and research in this field, to an evaluation of recent studies and to planning a research project.

E 449c. *EVALUATION IN HOME ECONOMICS*... Graduate; credit two hours. Daily except Saturday 12. Assistant Professor PATTERSON.

This course is designed to acquaint teachers, research workers or others with techniques used in measuring attainment in home economics education. Students will have an opportunity to prepare evaluating materials and plan for use of findings in program planning.

E 300. *SPECIAL PROBLEMS*... Graduate; credit as arranged. Members of the staff.

For students who wish to do independent advanced work on a problem not dealt with by other courses in the department.

E 400. *SPECIAL STUDIES*... Graduate; credit as arranged. Members of the staff.

Students working on theses or other research projects may register for this course. The staff members concerned must be consulted before registration.

HOME ECONOMICS EDUCATION CONFERENCES

Conference for Teachers. July 1-6. Auditorium, Van Rensselaer Hall.

A one-week refresher course for supervised teachers who are interested in keeping in touch with pertinent teaching materials and in discussing current educational problems.

Conference for State and City Supervisors. July 14-25. Room 114. Mornings.

A two-week conference for state and city supervisors who wish to work together on administrative, supervisory, and curricular problems and who have individual projects concerning which guidance is sought.

Neither of these conferences will carry college credit; therefore, there will be no tuition fee for them. However, public lectures, discussions, and other events which are part of the regular summer session will be open to teachers and supervisors who attend the conference.

For further information concerning these conferences write to:

Professor Margaret Hutchins
Martha Van Rensselaer Hall
College of Home Economics
Cornell University
Ithaca, New York

INDUSTRIAL AND TECHNICAL EDUCATION

I 83. *CURRICULUM CONSTRUCTION IN INDUSTRIAL AND TECHNICAL EDUCATION*... Undergraduate and graduate; credit two hours. Daily except Saturday 9. Assistant Professor BROPHY.

Deals with the fundamentals of curriculum construction as applied to the development of curriculums and courses of study for industrial and technical schools including technical institutes.

I 85. *PROBLEMS AND PROCEDURES IN APPRENTICE TRAINING*... Undergraduate and graduate; credit two hours. Daily except Saturday 11. Dr. BERGEVIN.

Current federal and state laws, apprenticeship indentures, related instruction classes, use of advisory committees, and other factors relating to the organization and conduct of apprentice training programs. Designed for both the apprentice training representative in industry and the supervisor in public schools.

I 86. *CURRENT TRENDS AND DEVELOPMENTS IN VOCATIONAL EDUCATION*... Undergraduate and graduate; credit two hours. Daily except Saturday 11. Dr. WRIGHT and Mr. HAWKINS.

An overview course for the general school administrator including school superintendents, high school principals and supervisors. Deals with the various types of programs in vocational and technical education, with particular emphasis placed on industrial and technical education and its place in public school education. Special lectures will be given by national and state leaders.

I 87. *INDUSTRIAL DIVERSIFIED PART-TIME COOPERATIVE PROGRAMS*... Undergraduate and graduate; credit two hours. Daily except Saturday 8. Professor BEACH.

The organization and conduct of a diversified part-time cooperative program particularly in the smaller high school. Responsibilities of the coordinator in such a program are emphasized.

I 88. *GROUP DISCUSSION TECHNIQUES IN INDUSTRIAL EDUCATION*... Undergraduate and graduate; credit two hours. Daily except Saturday 1 or 3. Professor BEACH.

A study of various methods used in group discussions such as symposiums, conferences, panels with particular emphasis placed on their use in the field of industrial education. Students will be expected to lead group discussions of current topics and problems in this field.

*I 89. *CURRICULUM WORKSHOP FOR PERSONS IN TECHNICAL INSTITUTES*... July 21-August 9. Undergraduate and graduate; credit three hours. Mr. SHORT and Professor L. EMERSON.

A three weeks' comprehensive course. An intensive and practical consideration of problems common to technical institutes. Morning sessions devoted to group exploration of specific problems; afternoon session concerned with consideration of individual problems.

Members of workshop will outline a specific problem upon which to concentrate. The problem delineated must be one upon which the student is working as part of his regular teaching responsibilities. The workshop provides for intensive attack on the problem with the critical aid of other members of the group.

Individual conferences between student and instructor or specialized consultant will be arranged.

I 130. *SUPERVISION OF INDUSTRIAL AND TECHNICAL EDUCATION*... Graduate; credit two hours. Daily except Saturday 8. Assistant Professor BROPHY.

Principles and practices in effective supervision of industrial and technical programs.

I 131. *SEMINAR IN INDUSTRIAL AND TECHNICAL EDUCATION*... Graduate; credit two hours. Daily except Saturday 9. Dr. WRIGHT and Mr. HAWKINS.

Intended for graduate students with experience in Industrial Education. A study of current problems, with arrangements for students to work on individual problems.

I 132. *ADMINISTRATION OF INDUSTRIAL AND TECHNICAL EDUCATION*... Graduate; credit two hours. Daily except Saturday 10. Dr. BERGEVIN.

Dealing with the responsibility of principals, city directors, and other administrative officers in industrial and technical high schools and technical institutes.

I 199. *SPECIAL STUDIES*... Graduate; credit and hours as arranged. Members of the staff.

Directed research in special problems.

A 242. *SEMINAR IN INDUSTRIAL ARTS EDUCATION*...Graduate; credit two hours. Daily except Saturday 9. Mr. KETCHAM.

Intended for graduate students with experience in Industrial Arts Education. A study of current problems affecting Industrial Arts Education.

A 242g. *INDUSTRIAL ARTS EDUCATION IN THE ELEMENTARY SCHOOL*...Undergraduate and graduate; credit two hours. Daily except Saturday 11. Mr. KETCHAM.

The organization and conduct of Industrial Arts courses in elementary schools.

NATURE STUDY AND SCIENCE EDUCATION

A 107b. *THE TEACHING OF NATURE STUDY AND ELEMENTARY SCHOOL SCIENCE*...Undergraduate and graduate; credit two hours. Lectures, M T W F 11; laboratory or field work, Th 2-4:30. Assistant Professor SCHMIDT.

This course deals with elementary school science for teachers and supervisors of science in elementary and junior high schools.

A 108. *FIELD NATURAL HISTORY*...Undergraduate and graduate; credit two hours. Lectures, M W 1:40-2:30. Field trips, M W 2:30-5; F 1:40-4. Professor PALMER and assistant.

Field trips and lectures devoted to a study of the natural history of various ecological units, with special emphasis on their contributions to the teaching of science.

A 203. *RESEARCH AND WRITING IN OUTDOOR EDUCATION*...Undergraduate and graduate; credit two hours. Daily except Saturday 8 and Friday 9. Professor PALMER.

It is recommended that this course be preceded by Field Natural History A 108, or its equivalent.

Designed to improve the interpretation of Natural History and the expression of interpretations through the written word. Each student should prepare a publishable article in this course.

A 226d. *METHODS AND MATERIALS FOR THE TEACHING OF EARTH SCIENCE*...Undergraduate and graduate; credit two hours. Prerequisite or parallel courses: elementary courses in geology, astronomy, and meteorology, or consent of the instructor. Lectures, M W Th F 9; laboratory or field work T 2-4:30. Assistant Professor SCHMIDT.

A consideration of problems of selection and organization of subject matter, of choice and use of materials, and of methods of teaching earth science, physiography, or general science.

RESEARCH

B 199. *INFORMAL STUDY IN EDUCATION*...Undergraduate credit as arranged. Members of the staff of the School of Education.

This privilege may be granted to a qualified student of junior rank or above, with the approval of his adviser and the consent of the appropriate member of the Education faculty.

B 300. *RESEARCH*...Graduate; credit as arranged. Members of the staff of the School of Education.

Students working on theses or other research projects may register for this course. The staff members concerned must be consulted before registration.

EXTENSION EDUCATION

From July 7 to 25, inclusive, eight courses for credit are offered primarily for the professional improvement of persons engaged in extension work in agriculture, home economics, and boys' and girls' club work. Emphasis is on methods, public relations,

sociology, psychology, and evaluation, as well as rural housing, farm management and human nutrition and their application in extension education. Afternoons will be devoted to optional activities such as field trips, visits to laboratories, various projects of interest, and to individual lectures. Applicants should note that these are unit courses beginning one week later than the regular session. The fee is \$36. For full particulars, ask for "Extension Service Summer School Announcement." Address Professor L. D. Kelsey, Roberts Hall, Ithaca, New York.

Two courses are given in each period. Each period is 75 minutes in length, with 15 minutes between classes. Each course daily except Saturday, July 19th; credit 1½ hours.

8:00 a.m.

*1. *PSYCHOLOGY FOR EXTENSION WORKERS*...Professor KRUSE, Warren Hall, Room 140.

The point of view in psychology for extension workers. The nature of man, with emphasis on the tendencies basic to effective influencing of human behavior. How people change their behavior.

*2. *NEWS WRITING AND PUBLIC RELATIONS*...Professor RECK, Warren Hall, Room 240.

Preparation and use of bulletins, motion pictures, radio scripts, press articles, circular letters, planning and operating a coordinated information service. Presentation of factors which develop and maintain public relations conducive to sound educational work, including agencies, media, institutions, policies, and means of procedure.

9:30 a.m.

*3. *RURAL HOUSING, E 330*...Assistant Professor LOPER. Van Rensselaer Hall, Room 408.

For men and women experienced in extension work. Lectures, discussions, demonstrations, conferences, with attention given to methods of presenting housing information to farm people. Subject matter to deal with planning, designing, constructing the farmhouse, including: analysis of the housing situation, social aspects, functional requirements, location with respect to site and other buildings, safe investment, remodeling possibilities, work centers, materials, utilities, furnishings for size and arrangement, plans, specifications, and construction. Fee, \$6.

*4. *RECENT DEVELOPMENTS IN NUTRITION AND THEIR RELATION TO FAMILY PROBLEMS, E 345a*...Prerequisite, some college work in food and nutrition and experience in teaching lay groups. Associate Professor STEININGER, Warren Hall, Room 140.

Lecture and discussion. Evaluation of the methods used in studying problems related to human nutrition; findings of some of these studies; the application of these findings to practical problems of feeding a family; the use of these findings in teaching nutrition to lay groups. Fee, \$1.

11:00 a.m.

*5. *EXTENSION EVALUATION*...Dr. GALLUP, Mrs. SABROSKY, and Mr. LEAGANS. Warren Hall, Room 140.

Evaluation, clarification of objectives, techniques that any extension worker might use in measurement, sampling procedures, analysis, interpretation, presentation and use of data. It is not the intention to make "a studious expert" of each student, but to give a broad concept of extension program development and methods of systematically appraising the work.

*6. *RURAL SOCIAL TRENDS*...Professor WILEDEN. Warren Hall, Room 240.

A study of social changes in rural areas which have taken place during the past twenty-five years, consideration of population shifts, differentiation between current

changes which may be temporary and those which are of long-time significance, the implication of such trends for extension workers and extension programs.

1:30 p.m.

*7. *PHOTOGRAPHIC AND OTHER VISUAL AIDS*...Professor BENNETT. Roberts Hall, Room 392.

Deals with taking pictures for newspapers, bulletins, film strips, projection, slides and other media, including printing and making slides. Also a consideration of the elements of good posters, exhibits, models, and other visual aids.

*8. *POSTWAR FARM MANAGEMENT*...Professor WARREN. Warren Hall, Room 140.

Farming as a business, factors affecting profits, size of business, choice of enterprises, getting started in farming, labor efficiency, types of farming, land classification, organization and management of specific farms, father and son arrangements — all with particular reference to postwar conditions. Trips will be made to visit farms in nearby regions.

NATURAL SCIENCES

BACTERIOLOGY

A 1. *GENERAL BACTERIOLOGY*...Undergraduate and graduate; credit two or four hours. Lectures, daily except Saturday 1:40; laboratory, daily except Saturday 2:30-4:30. Professor STARK and assistant.

An introductory course giving a general survey of the field of bacteriology, together with the fundamentals essential to further work in the subject. The morphology, physiology, and classification of bacteria; the culture of microorganisms, simple and differential staining, and general bacteriological technique; the bacteriology of soil, air, water, sewage, milk, and foods; the principles of immunity and the microbiology of disease. Laboratory fee, \$10, for those seeking four credit hours.

A 220. *SPECIAL PROBLEMS*...Credit and hours by arrangement. Professors SHERMAN and STARK.

Special problems in bacteriology may be elected by qualified students with the permission of the instructors.

BOTANY

S 1a. *GENERAL BOTANY — ANATOMY AND PHYSIOLOGY*...Undergraduate; credit three hours. Equivalent to Botany 1, first term. Lectures, daily except Saturday 2; laboratory and conferences, daily except Saturday 3-4:30. Dr. CUTTER.

The structures and life processes of the higher plants are examined in detail, with considerable attention to information necessary for more advanced or practical work with plants. Students taking this course may attend the field trips offered in connection with Botany 1b. Laboratory fee, \$3.50.

S 1b. *GENERAL BOTANY — MORPHOLOGY AND TAXONOMY*...Undergraduate; credit three hours. Equivalent to Botany 1, second term. May be taken in conjunction with Botany 1a, or independently. Lectures, daily except Saturday 10; laboratory, daily except Saturday 11-12:30. Three half-day field trips on Saturdays to be arranged. Professor PETRY and assistant.

Representatives of the principal groups of plants are studied with a view to acquainting the student with the plant kingdom as a whole. The principal families of ferns and flowering plants are examined and practice in identification is given.

The field work is intended to afford to teachers and others first-hand knowledge of the commoner plants of all the great groups. Facilities for collecting plant materials for teaching or other purposes will be provided. Laboratory fee, \$3.50.

A 55. *WEEDS AND POISONOUS PLANTS*... Undergraduate and graduate; credit three hours. Prerequisite, course 1 or its equivalent. Lectures, daily except Saturday 10; laboratory and field work, T Th 2-5:30. Two all day trips. Professor MUENSCHER.

Special emphasis is given to characteristics, identification, and methods of eradication and control of weeds and poisonous plants. Laboratory fee, \$3.

A 115. *AQUATIC PLANTS*... Undergraduate and graduate; credit three hours. Prerequisite, course 1 or its equivalent. Lectures, daily except Saturday 8; laboratory and field work, M W 2-5:30. Two all day trips. Professor MUENSCHER.

A study of the taxonomy and ecology of fresh water plants, beginning with the algae and concluding with the aquatic angiosperms. Laboratory fee, \$3.

A 117. *TAXONOMY OF VASCULAR PLANTS*... Undergraduate and graduate; credit four hours. Prerequisite, course 1 or its equivalent. Lectures, daily except Saturday 10; laboratory, M T W Th 11-12:30. Field trips, T Th 2-6. Associate Professor CLAUSEN.

A general course in taxonomy, including a study of the major families of seed plants and ferns, a consideration of the principles of classification, and field work on the flora of the Ithaca region. Laboratory fee, \$4; deposit, \$5.

A 31. *PLANT PHYSIOLOGY*... Undergraduate and graduate; credit four hours. Prerequisite, General Botany or Biology, and Elementary Chemistry. Lectures, daily except Saturday 9; laboratory, 10-12. Associate Professor CLARK.

This course is designed to acquaint the student with the important life processes of plants. Topics such as water-relations, photosynthesis, translocation, digestion, respiration, mineral nutrition, and growth relations are studied in some detail and particular emphasis is placed, both in laboratory and in classroom, on discussion of the principles and their applications to living plants. Laboratory fee, \$4; deposit, \$3.

ENTOMOLOGY

A 12. *GENERAL ENTOMOLOGY*... Undergraduate and graduate; credit two hours. Prerequisite, Biology 1 or Zoology 1 or equivalent. Lectures, M W F 9; practical exercises, M W 2-4:30. Professor READIO.

This course includes lectures and demonstrations on the characteristics of the orders and families of insects with the study of their habits, life histories, and relations to other animals and plants. The laboratory work consists of the study of the structure, metamorphosis, and classification of insects. Field trips to study insects in their natural habitats are an important feature. Each student is required to collect and prepare a typical collection of insects. Opportunities are given for the rearing of insects. Textbook: Matheson's *Entomology for Introductory Courses*. Equipment: a hand lens, insect cases, insect pins, and labels. These can be purchased in Ithaca. Laboratory fee, \$2.50.

A 16. *THE ECOLOGY OF INSECTS*... Undergraduate and graduate; credit two hours. Prerequisite, Biology 1 or Zoology 1 or equivalent. Lecture, T Th S 9; laboratory studies and field trips, T Th 2-4:30. Professor PALM.

A general study of insects in relation to their environment. Attention is given to life history studies in the field and insectary; the role that insects play in different natural associations; the relations between structure, instinct, habitat, and ways of living. Photographing insects in natural color in the field and laboratory is included as part of the course. Laboratory fee, \$2.50.

A 41. *ELEMENTARY ECONOMIC ENTOMOLOGY*... Undergraduate and graduate; credit two hours. Lectures, M W F 10; practical exercises, T Th 10-12:30. Professor READIO.

This course includes lectures, conferences, and discussions on the life histories and habits of injurious insects, together with methods of control. The practical exercises include a study of the more important insecticides and of as many of the

common insect pests as time permits. There will be a number of field trips. Laboratory fee, \$2.

A 300. *RESEARCH IN ENTOMOLOGY*...Credit one to three hours. Laboratory fee and hours to be arranged. Prerequisite, permission from the professor under whom the work is to be taken. Professors PALM and READIO.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

Courses in this department are offered to three groups of people. Courses A1, A5, A12, A13, and A199 are of interest to amateurs. Courses A118, A119, and A199 are offered to practicing nurserymen, park and estate superintendents, landscape engineers and architects. Courses A12, A13, A118 and A199 are given for advanced students in horticulture and landscape gardening.

A 1. *ELEMENTARY FLORICULTURE*...Undergraduate; credit two hours. Lectures, M W F 9; laboratory, M T 1:40-4:30. Mr. LEE.

An elementary course designed for those who do not wish to major in floriculture but who wish a practical knowledge of the culture and use of plants indoors and in the garden. Laboratory fee, \$3.

A 5. *FLOWER ARRANGEMENT*...Undergraduate; credit two hours. Lecture, T Th 9; laboratory, T Th 10-12:30. Mr. GERBER.

The study and practice of the principles and methods of arranging flowers and other plant materials for decorative use. Laboratory fee, \$8; deposit, \$2.

A 12. *HERBACEOUS PLANT MATERIALS*...Undergraduate and graduate; credit two hours. Lectures, M T W Th 8; laboratory, W Th 1:40-4:30. Mr. LEE.

A study of the ornamental herbaceous plants used in landscape and garden plantings. Emphasis is placed on the identification, uses, and culture of annuals and summer flowering perennials. Problems in garden maintenance are considered. Laboratory fee, \$2.

A 13. *WOODY PLANT MATERIALS FOR LANDSCAPE PLANTING*...Undergraduate and graduate; credit four hours. Lectures, M T W Th 9; laboratory and field work, M T 10-12:30. Assistant Professor CORNMAN.

A study of the characteristics and requirements of trees, shrubs, and vines for landscape planting. The laboratories and field trips enable the student to recognize common woody plants. The lectures include such items as planting areas, planting practices, and plant materials, and aim to give the student an appreciation of plants not only as growing things but as possible units in landscape design. All members of the class will participate in an all-day excursion to visit private estates and public parks in Rochester; the transportation charge will be \$5. Laboratory fee, \$3.

A 118. *LANDSCAPE CONSTRUCTION*...Undergraduate and graduate; credit four hours. Prerequisite, some knowledge of mechanical drawing and either practical experience or elementary training in landscape design. Lectures, T 7-9:30 p.m.; laboratory, W Th 2-5, F 8-12 and 1-5, S 8-1. Associate Professor PORTER.

A course covering the construction problems of the service departments of nursery landscape firms, landscape contractors, greenskeepers, and park superintendents. A study of the materials used in landscape construction, the design and drafting of details, costs, and estimates; with actual practice in and supervision of a variety of problems such as grading, earthwork, walls, terraces, steps, pools, and the like. Laboratory fee, \$8.

A 119. *GARDEN PLANTING AND MAINTENANCE*...Undergraduate and graduate; credit three hours. Prerequisite, elementary courses in Botany, Plant Physiology and Ornamental Horticulture. Lectures, M W 7-9 p.m.; laboratory, M T W 10-12:30. Associate Professor PRIDHAM.

The growing, transplanting and maintenance of garden flowers, trees and shrubs. Special consideration is given to the application of basic science to modern garden

practice, propagation, soil and fertilizers, transplanting, watering, weed control, and pruning. Consideration is also given to special plant materials for specific locations and purposes. Trips will be made to private estate and park plantings. Laboratory fee, \$3.

A 199. *SPECIAL PROBLEMS*. . . Undergraduate and graduate; credit and hours to be arranged. Associate Professor Porter and members of the Department staff.

Special problems related to the fields of horticulture and landscape planning and planting may be elected by qualified persons with permission of the instructor. Laboratory fee dependent upon the nature of the problem.

GENETICS

A 101. *GENERAL GENETICS*. . . Undergraduate and graduate; credit four hours. Prerequisite, a course in botany, zoology, or biology. Lectures, daily except Saturday 10; laboratory, daily except Saturday 11-12:30; one conference period to be arranged. Associate Professor CUSHING.

A general study of the fundamental principles of genetics. Discussion of simple cases of inheritance, gene interaction, gene linkage, inheritance of quantitative characters, inheritance of sex, effects of inbreeding and crossing, the origin of heritable variation, gene action, and the relation of genetical principles to eugenics. Laboratory studies of hybrid material in plants and animals and breeding experiments with *Drosophila*. Laboratory fee, \$3.

ORNITHOLOGY

A 9. *ORNITHOLOGY*. . . Undergraduate; credit three hours. Lectures, M W F 9; laboratory, M W 1:40-4:30, or M W F 10-12; field trips, T Th 5:30-8 a.m. Professor A. A. ALLEN and Dr. E. G. ALLEN.

This course provides an introduction to the study of birds and familiarity with the local species. The lectures cover classification, migration, coloration, song, nest-building, eggs, care of young, methods of attracting birds, and their economic importance. The laboratory work with bird skins, nests, and eggs gives an intimate knowledge of the birds of eastern North America, their life histories and distribution, and familiarity with the use of manuals. The aim of the field work is the identification of birds by their songs and habits as well as by their plumage. Laboratory fee, \$3.

A 126. *ADVANCED ORNITHOLOGY*. . . Undergraduate and graduate; credit three hours. Prerequisite, Ornithology A 9 or its equivalent. With special permission may be taken with A 9. Lectures, T Th 9; laboratory, T Th 1:40-4:30, and one other period by appointment. Professor A. A. ALLEN. Students desiring this course should write Professor Allen for reservations.

The structure and classification of the birds of the world; geographical distribution; the literature and institutions of ornithology; the preparation of bird skins and bird photography. Laboratory fee, \$3.

ZOOLOGY

S 1a, S 1b. *INTRODUCTORY ZOOLOGY*. . . Undergraduate. Courses designed so that a student may take either or both.

S 1a. *AN INTRODUCTION TO THE VERTEBRATES*. . . Undergraduates; credit three hours. Recitations, daily except Saturday 9; laboratory, M W and 1st, 3rd, and 5th F 1:40-4. Mr. BOND and assistant.

Course presents a survey of the anatomy and physiology of the vertebrate organ systems; the classification of the vertebrates; and their principal characteristics and habits of life. Important biological principles and concepts are stressed. A detailed study of the frog as a representative vertebrate is given in the laboratory. Laboratory fee, \$3.

S 1b. *AN INTRODUCTION TO THE INVERTEBRATES*... Undergraduate; credit three hours. Recitations, daily except Saturday 11; laboratory, T Th and 2nd, 4th, and 6th F 1:40-4. Mr. BOND and assistant.

Course deals with the anatomy and physiology of representative animals lacking backbones; their classification and characteristics; their life cycles, habits, and habitats; and their relations to one another and to the welfare of man. Material dealing with the concept of evolution and other biological principles is presented. Laboratory fee, \$3.

S 8. *SYSTEMATIC VERTEBRATE ZOOLOGY AND ECOLOGY*... Undergraduate and graduate; credit four hours. Lectures, M T W Th 1:40-2:30; laboratory and field work, M T W Th 2:30-5:30. One all-day trip will be taken. Occasionally a field trip, 5:30-8 a.m. may be substituted for the regular period. Associate Professor HAMILTON.

Lectures on fish, amphibians, reptiles and mammals, their habits, life-histories, coloration, respiration, locomotion, reproduction, and adaptations; together with their classification, nomenclature, characters, and relationships. Laboratory study of the parts employed in the classification of these groups, with special training on the identification of the vertebrates of Eastern United States. Field work is partly to give practice in field observations and in ready identification of local vertebrates in their natural environment and partly to introduce some ecological methods. Laboratory fee, \$4.50.

S 11. *COMPARATIVE ANATOMY OF THE VERTEBRATES*... Undergraduate and graduate; credit six hours. Prerequisite, Zoology 1 or 2 or its equivalent. Lecture, daily except Saturday 10; laboratory, daily except Saturday 1-5. This course is the equivalent of Zoology 11a and 11b. Associate Professor GILBERT and Mr. SNYDER.

A thorough study and dissection of representative vertebrate types, including a fish, amphibian, reptile, bird, and mammal, together with demonstrations on species other than the types dissected.

The course is intended to give students an evolutionary background for the study and appreciation of the structure of higher vertebrates, including man. Laboratory fee, \$20.

PHYSICAL AND MATHEMATICAL SCIENCES

CHEMISTRY

S 107. *GENERAL CHEMISTRY*... Undergraduate; credit six hours. Lectures and recitations, daily except Saturday 8-10. Laboratory, daily except Saturday 10-1. Assistant Professor VAN ARTSDALEN and assistant.

This course gives an introduction to chemistry, with emphasis on the fundamental concepts and principles which deal with the nature of matter and its behavior. The states of matter, the quantitative aspects of chemical changes, chemical equilibrium, oxidation-reduction, electrolytic dissociation, and solution phenomena are discussed. The structure of atoms is correlated with their properties, their classification, and the nature of their compounds. The more common elements and compounds are considered, and organic chemistry is studied briefly. The application of the scientific method is stressed, and abundant lecture demonstrations supplement the experience which the student acquires in the laboratory. Laboratory fee, \$15.

S 205. *INTRODUCTORY QUALITATIVE ANALYSIS*... Undergraduate; credit three hours. Prerequisite, General Chemistry. Chemistry S 206 must be taken with S 205. Lectures, daily except Saturday 8; recitations, T Th 11. Assistant Professor PAUL.

A study of the application of the theories of general chemistry to the systematic separation and detection of the common elements and acid radicals.

S 206. *INTRODUCTORY QUALITATIVE LABORATORY*... Undergraduate; credit three hours. Prerequisite, General Chemistry. Must be taken with Chemistry S 205. Laboratory, daily except Saturday 9-1. Assistant Professor PAUL and assistant.

A study of the properties and reactions of the common elements and acid radicals, and their detection in various solutions. Laboratory fee, \$20.

S 210. *INTRODUCTORY QUALITATIVE ANALYSIS*... Undergraduate; short course; credit three hours. Prerequisite, General Chemistry. Lectures, daily except Saturday 8; laboratory, daily except Saturday 9-12. Assistant Professor PAUL and assistant.

A study of the properties and reactions of the common elements and acid radicals, and their detection in various solutions. Laboratory fee, \$15.

S 220. *INTRODUCTORY QUANTITATIVE ANALYSIS*... Undergraduate and graduate; credit three hours. Prerequisite, Chemistry S 205 and S 206 or S 210. Chemistry S 221 must be taken with Chemistry S 220. Lectures, daily except Saturday 8; recitations, T Th 9. Professor NICHOLS.

A study of the fundamental principles of gravimetric and volumetric analysis with practice in stoichiometry.

S 221. *INTRODUCTORY QUANTITATIVE LABORATORY*... Undergraduate and graduate; credit three hours. Prerequisite, Chemistry S 205 and S 206 or S 210. Must be taken with Chemistry S 220. Laboratory, M W F 9-1 and T Th 10-1. Professor NICHOLS and assistant.

Laboratory practice in the preparation and standardization of various volumetric solutions and the analysis of a variety of substances by volumetric and gravimetric methods. Laboratory fee, \$20.

S 225. *INTRODUCTORY QUANTITATIVE ANALYSIS*... Undergraduate; short course; credit four hours. Prerequisite, Chemistry S 205 and S 206 or S 210. Lectures, daily except Saturday 8; laboratory, daily except Saturday 9-12. Professor NICHOLS and assistant.

A study of the fundamental principles of gravimetric and volumetric analysis, and the analysis of various substances by these methods. Laboratory fee, \$15.

S 305a. *INTRODUCTORY ORGANIC CHEMISTRY*... Undergraduate and graduate; credit three hours. Prerequisite, General Chemistry; Qualitative Analysis is desirable but not required. Lectures and written reviews, daily except Saturday 8, and also daily except Saturday 9, during the first three weeks. Dr. DETAR.

A study of the more important compounds of carbon, their occurrence, methods of preparation, relations, and uses. The work covered is equivalent only to the first half of the year-course; students who wish a complete course should register for Chemistry S 375.

S 310a. *INTRODUCTORY ORGANIC LABORATORY*... Undergraduate and graduate; credit three hours. Prerequisite or parallel course, Chemistry S 305a. Laboratory experiments and oral reviews, daily except Saturday 10-12:30. Dr. DETAR and assistant.

The student prepares typical compounds of carbon and familiarizes himself with their properties, reactions, and relations. Laboratory fee, \$20.

S 305b. *INTRODUCTORY ORGANIC CHEMISTRY*... Undergraduate and graduate; credit three hours. Prerequisite, Chemistry S 305a. Lectures and written reviews, daily except Saturday 8, and M W F 9. Assistant Professor CAIN.

A continuation of Chemistry S 305a.

S 310b. *INTRODUCTORY ORGANIC LABORATORY*... Undergraduate and graduate; credit two or three hours. Prerequisite or parallel course, Chemistry S 305b. Conferences, T Th 9; laboratory, daily except Saturday 10-12:30. Assistant Professor CAIN and assistant.

Laboratory preparations in continuation of Chemistry S 310a. Laboratory fee, \$20.

S 375. *ELEMENTARY ORGANIC CHEMISTRY*... Undergraduate and graduate; credit six hours. Prerequisite, General Chemistry; Qualitative Analysis is desirable but not required. Lectures, daily except Saturday 8-10; laboratory, daily except Saturday 10-12:30. Dr. DE TAR and assistant.

A study of aliphatic and aromatic organic compounds, their occurrence, relations, and uses. Laboratory experiments on the preparation and reactions of typical organic compounds. Laboratory fee, \$15.

S 405a. *INTRODUCTORY PHYSICAL CHEMISTRY*... Undergraduate and graduate; credit three hours. Prerequisite, a knowledge of calculus, elementary physics and elementary organic chemistry. Lectures, daily except Saturday 8, and T Th 9. Assistant Professor WOOD.

A systematic presentation of the principles of physical chemistry. The topics include: the properties of gases, liquids, and solids; physical and chemical equilibrium in homogeneous and heterogeneous systems; the mass law, theorem of LeChatelier, and the phase rule; thermochemistry and elementary thermodynamics; the theory of solutions; ionic equilibria; chemical kinetics; problems in physical chemistry.

The work covered is equivalent only to the first half of the year-course. The second half, Chemistry S 405b, will be given in the post-session.

S 410a. *INTRODUCTORY PHYSICAL LABORATORY*... Undergraduate and graduate; credit three hours. Prerequisite or parallel course, Chemistry S 405a. Recitation, W 9; laboratory, M F 9-1 and T W Th 10-1. Assistant Professor WOOD and assistant.

Qualitative and quantitative experiments illustrating the principles of physical chemistry and practice in performing typical physico-chemical measurements. Laboratory fee, \$15.

S 530. *INTRODUCTORY CHEMICAL MICROSCOPY*... Undergraduate and graduate; credit three hours. Prerequisite, Physical Chemistry or special permission. Lectures, M W F 10. Laboratory, M W F 11-1, T Th 10-1; additional periods to be arranged. Professor MASON.

Microscopes and their accessories, as applied to problems in chemistry and technology. Micrometry and particle size determination; quantitative analytical methods; microscopical characteristic and physical chemistry of crystals; lens systems and photomicrography; study of industrial materials such as textile and paper fibers. Laboratory fee, \$5.

GEOLOGY AND GEOGRAPHY

S 1 and S 5. *GENERAL GEOLOGY AND PHYSIOGRAPHY*... Introduction to Earth Science. Given as two correlated courses, as indicated below, either of which may be taken separately for two hours credit, but which, taken together, for four hours credit, constitute the lecture and textbook part of Geology A as given in the regular session. S 1 and S 5, together with S 9 and S 10, 6 hours credit, are counted the equivalent of Geology A, the six-hour basic course in elementary general geology and physiography. Courses S 5, S 9 and S 10 are counted the equivalent of Geology 100.

S 1. *DYNAMIC GEOLOGY AND PHYSIOGRAPHY*... Undergraduate; credit two hours. Daily except Saturday 8. Professor VON ENGELN.

The content of this course includes the topics: history of geological ideas; processes of weathering and their results on land-forms; action of streams and valley forms; the morphology of deserts; oceanography; marine erosion; mountain topography; phenomena of glaciers and glaciation; nature of continents and ocean basins; geological climates; orogenies.

The lectures are illustrated by lantern slides and are correlated with study of a textbook. Students registering in Courses S 1 are advised to take also Course S 5 and, for a general course in elementary geology, should, further, take Courses S 9 and S 10.

S 5. *PETROLOGIC, STRUCTURAL, AND HISTORIC GEOLOGY*... Undergraduate; credit two hours. Daily except Saturday 11. Associate Professor WELLS.

Lectures and correlated textbook readings upon the following topics: origin of the earth; materials of the earth's crust and their arrangement; diastrophism; earthquakes; vulcanism; structural phenomena; metamorphism; origin of mountains; ground water; caves; age of the earth and geological time periods; the fossil record; origin of man.

S 11. *GENERAL GEOGRAPHY*... Undergraduate and graduate; credit two hours. Daily except Saturday 10. Professor VON ENGELN.

In the lectures the fundamental concepts of geography, direction and position, are considered in connection with map projections and map reading; the regions of the world are discussed in terms of climatic types generally, and then, in particular, with reference to political divisions. The tropical belt of lands is given special attention. The concepts of geopolitics are outlined in their relation to current world problems. The lectures are supplemented by textbook and atlas study to insure appreciation of the broad principles of environmental geography and a knowledge of place locations.

Laboratory and Field Courses in Geology and Physiography:

S 9. *GEOLOGY LABORATORY COURSE*... Undergraduate; credit one hour. W F 1:40-4. Mr. NETSCHERT.

This course is designed to supplement courses S 1 and S 5. A study is made of the commoner rocks and minerals, of the commoner structural phenomena, of the interpretation and uses of topographic and geologic maps, and of the characteristic life forms developed in the different geological periods. Laboratory fee, \$1.

S 10. *GEOLOGY AND PHYSIOGRAPHY FIELD COURSE*... Undergraduate and graduate; credit one hour. M 1:40-4:30 and two Saturdays, all-day. Associate Professor WELLS.

This course should be elected by all students in courses S 1 and S 5 who desire to secure an appreciation of field-observation and field-interpretation of geologic and physiographic phenomena.

Students are required to take field notes and to write a report on each excursion. Marks are based on the contribution made by the student to the field discussions and on the degree of excellence of the reports submitted. Mimeographed outlines of the excursions are to be secured from the bookstores by each student.

Each excursion entails some cost for bus fare. For first excursion bring 10¢. An inclusive rate will be announced then for the rest of the trips and is to be paid in advance, probably \$10. First excursion, Monday, July 7.

Outline of Excursions:

CASCADILLA GORGE. Monday, July 7.

SNYDER HILL. Monday, July 14.

NORTHERN PENNSYLVANIA. Saturday, July 19. (All-day trip)

PORTLAND POINT. Monday, July 21.

SAND DUNES OF LAKE ONTARIO. Saturday, July 26. (All-day trip)

ENFIELD GORGE AND FALLS. Monday, July 28.

TERMINAL MORAINES; KAME, ESKER, AND OUTWASH DEPOSITS.

Monday, August 4.

Further details regarding these excursions may be obtained on registration day.

FIELD SCHOOL IN GEOLOGY

*S 21. *SUMMER FIELD SCHOOL IN GEOLOGY*... Undergraduate and graduate; credit six hours. Professor NEVIN. June 16-July 26.

Registration limited to men. For details write to the Department of Geology and Geography, McGraw Hall, for the special announcement.

MATHEMATICS

S 55b. *ANALYTIC GEOMETRY AND CALCULUS*... Undergraduate; credit five hours. Prerequisite, 55a or the equivalent. Daily 8 and 11.

S 60a. *ANALYTIC GEOMETRY AND CALCULUS*... Undergraduate; credit three hours. Prerequisite, Trigonometry. Daily 8.

A beginning course in the subject.

S 60b. *ANALYTIC GEOMETRY AND CALCULUS*... Undergraduate; credit three hours. Prerequisite, Mathematics 60a or the equivalent. Daily 10.

S 60c. *ANALYTIC GEOMETRY AND CALCULUS*... Undergraduate; credit three hours. Prerequisite, Mathematics 60b or the equivalent. Daily 12.

S 133. *DETERMINANTS AND MATRICES*... Undergraduate and graduate; credit three hours. Prerequisite, Mathematics 60c or the equivalent. Daily 8. Professor JONES.

A treatment of such topics as determinants, matrices, linear dependence, linear equations and linear transformations, numerical methods of computation and reduction by means of orthogonal transformations.

S 200. *ELEMENTARY DIFFERENTIAL EQUATIONS*... Undergraduate and graduate; credit three hours. Prerequisite, Mathematics 60c or the equivalent. Daily 10. Professor AGNEW.

A beginning course in the subject.

S 310. *PROJECTIVE GEOMETRY*... Undergraduate and graduate; credit three hours. Prerequisite, Mathematics 60b or the equivalent. Daily 9. Assistant Professor POLLARD.

A first course in projective geometry, with emphasis on synthetic methods.

In the summer of 1948 the department plans to offer a course in Advanced Calculus, one in Groups, Rings, and Fields, and one or more other courses later to be announced.

METEOROLOGY

A 1a. *METEOROLOGY*... Undergraduate and graduate; credit two hours. Lectures and discussions, daily except Saturday 10. Professor MORDOFF.

This course is adapted to the needs of teachers and students in subjects in which the weather is an important factor, particularly teachers of general science, physical geography, and agriculture. It is designed to acquaint the student with the laws governing the primary and secondary circulation of the atmosphere, and with the development, progression, and conditions that attend cyclones, tornadoes, and other atmospheric phenomena. Attention is given to the principles and practice of weather forecasting from weather maps and from local observations. Students taking the course at the graduate level will be assigned additional work.

A 1b. *METEOROLOGY, LABORATORY COURSE*... Undergraduate and graduate; credit one hour. T Th 11-1, or other periods to be arranged. Must be accompanied by course A 1a. Professor MORDOFF.

The work comprises the study of the principal weather and climatic elements with the aid of maps, charts, and instruments. The various meteorological instruments will be studied, as well as the methods of taking and recording the observations. Opportunity will be given the student for making practice forecasts. Students taking the course at the graduate level will be assigned additional work.

A 2. *GENERAL CLIMATOLOGY*... Undergraduate and graduate; credit one hour. Lectures and discussions, M W F 11. Should be accompanied or preceded by course A 1a. Professor MORDOFF.

This course is designed to give a general knowledge of Climatology and of the various climates of the United States, with emphasis on those of New York State.

A 6. *SPECIAL PROBLEMS*... Undergraduate and graduate; credit and hours by arrangement. Professor MORDOFF.

Special work in meteorology and climatology may be elected by qualified students with the permission of the instructor.

PHYSICS

S 1. *ELEMENTS OF PHYSICS*... Undergraduate and graduate; credit four hours. Lectures, recitations, and discussion periods, daily 9; laboratory, T Th 2-4:30. Professor GRANTHAM and assistants.

May not be used to satisfy the science requirement in the College of Arts and Sciences.

This is a course designed to meet the needs of teachers of high school physics. The subject matter will be that of the New York State Syllabus of Physics and the State Regents examinations. The demonstrations, laboratory work, and problem drill will emphasize those fundamentals stressed in the syllabus. Laboratory fee, \$5.

S 7. *INTRODUCTORY EXPERIMENTAL PHYSICS*... Undergraduate; credit four hours. Lectures, daily except Saturday 8; recitations, daily except Saturday 10; laboratory, M W F 2-4:30. Assistant Professor NEWHALL and assistants.

Demonstrations, theory, problems, and experiments covering the subjects of mechanics, wave motion, heat, and sound. Laboratory fee, \$5.

S 16. *WAVE MOTION, SOUND, AND HEAT*... Undergraduate; credit three hours. Prerequisite, Physics 15 and Calculus, or simultaneous registration in Mathematics 55a or 60a. Lectures, T Th 11; recitations, daily except Saturday 8; laboratory, T Th 2-4:30. Professor GRANTHAM and assistants.

Demonstrations, theory, problem drill, and experiments covering wave types, wave motion, sound production and reception, acoustic measurements, temperature measurement, calorimetry, changes of state, liquefaction of gases, thermal behavior of gases, heat transfer, and elementary thermodynamics. Laboratory fee, \$5.

S 21. *ELECTRICITY AND MAGNETISM*... Undergraduate; credit three hours. Prerequisites, Physics 11 and 12, and Mathematics 60c or 65c (or either in parallel). Required of candidates for degrees of B.Chem.E., B.E.E., and B.M.E. Recitations, daily 11; laboratory, T or Th 2-4:30. Assistant Professor NEWHALL and assistants.

A study of the fundamental laws of electric and magnetic fields and their applications to elementary circuit phenomena. Topics covered: the electrostatic field; potential; Gauss's Law; study of direct current circuits; Kirchhoff's rules; the magnetic field of steady currents; induced emfs; inductance; capacitance; simple transients. The laboratory work deals with the fundamentals of electrical measurements in direct current circuits. Laboratory fee, \$2.50.

S 22. *ELECTRONICS AND OPTICS*... Undergraduate; credit three hours. Prerequisites, Physics 12, Differential and Integral Calculus. Five recitation periods a week, and one laboratory period. Hours to be arranged.

Selected topics in thermionics, photoelectricity, elementary geometrical optics, physical optics, heat radiation, simple spectra. The laboratory work covers certain phases of electronics such as the measurement of work function, study of gas filled photocell, characteristic curves of the magnetron. Other experimental work deals with photometric measurements, resolving power, polarization of light. Laboratory fee, \$2.50.

S 83. *INTERMEDIATE AND ADVANCED UNDERGRADUATE PHYSICS LABORATORY*... Undergraduate and graduate; credit one to three hours. Prerequisite, an introductory college course in Physics. The laboratory will be open daily except

Saturday from 1:40-4:00. Associate Professor TOMBOULIAN and assistants. Laboratory fee, \$5 for each laboratory credit hour.

The experiments will be chosen to meet the needs and previous experience of the student. For those students of less experience, the emphasis will be placed on physical principles and a wide range of topics provided. Experiments in mechanics, properties of matter, heat, sound, light, and electricity may be performed. For the student who has had considerable experience in physical measurements, apparatus and equipment are available for work in a wide variety of fields. The student will work independently on a group of experiments selected to meet his individual requirements.

S 123. *ELECTRICITY AND MAGNETISM*... Undergraduate and graduate; credit three hours. Prerequisite, knowledge of Calculus and electrical circuits. Associate Professor TOMBOULIAN. Daily 8.

Electrostatic and electromagnetic fields, polarization of dielectrics and magnetic media, displacement current, plane electromagnetic waves, the Poynting vector.

PHYSICAL EDUCATION

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