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Calendar

June 13, <i>Monday</i>	Instruction begins, Field School in Geology.
July 5, <i>Tuesday</i>	Registration for regular six-weeks Summer Session, 8:30 a.m.-12:30 p.m., 1:30 p.m.-4 p.m., Barton Hall. Fees are due for payment at the Treasurer's office, Administration Building.
July 6, <i>Wednesday</i>	Instruction begins at time and place announced for each course. Registration is continued at the Summer Session office.
July 9, <i>Saturday</i>	Instruction continues on this Saturday.
July 11, <i>Monday</i>	Last day for payment of fees at the Treasurer's office, which closes at 4 p.m. Instruction begins, Extension Service Summer School.
August 12, <i>Friday</i>	Final examinations begin; schedule on page 25.
August 13, <i>Saturday</i>	Summer Session ends, 4 p.m.

Be sure to bring this Announcement with you for use on registration day and throughout the Summer Session.

General Information

THE Administrative Board of the Summer Session offers academic instruction for both graduates and undergraduates by members of 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.

This unification of the curricula and faculties of the several schools and colleges makes possible the adaptation of academic work to the special needs of summer students. Undergraduate courses are equivalent with required and elective collegiate courses leading to the baccalaureate. Advanced courses, seminars, and informal study, treating topics of concern to students with special interests, are designed with particular regard for what can satisfactorily be treated in a short term and in the summer time. The needs of teachers are met not only in the workshops, seminars, and professional courses in Education, but also in departmental courses. A number of unit programs and special courses have been inaugurated for professional workers other than teachers.

All the necessary facilities of the University are available to students registered in the Summer Session: libraries, classrooms, and laboratories; residence halls, dining rooms, and cafeterias; health and infirmary services; student union, chapel, playing fields, and recreational areas.

ADMISSION

The Summer Session places the facilities of the University at the disposal of any person who can use them to good advantage and for serious purposes during the summer period. Admission will not be granted to persons who are inadequately trained for the work they propose, or where records in Cornell University or elsewhere are unsatisfactory. Nor 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 the Summer Session establishes no priority with respect to admission to the regular terms under quotas now in effect. Students seeking admission to an undergraduate college in the fall should apply to the Director of

Admissions. Students seeking admission to the Graduate School should apply to the Dean of the Graduate School.

APPLICATION FOR ADMISSION....Application for admission to the Summer Session 1949 must be made on a 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. A certificate of admission, which is a prerequisite for registration in the Summer Session, will be mailed to the applicant after favorable action.

UNDERGRADUATES....Undergraduate candidates for the baccalaureate at Cornell University or elsewhere are required to submit, on the application form, (1) evidence of good standing in their college, and (2) a program of study approved by the proper officers of their college, which will act as a preregistration for courses. *This preregistration is final*, and can be changed only by filing a new application for admission, endorsed as was the first application, and stating a sufficient reason for the change.

Junior standing or above is required of all undergraduates matriculated in institutions other than Cornell University. By definition, *a student has achieved junior standing if he has completed half the credit requirements for the baccalaureate before July 1, 1949.* Cornell undergraduate women who have not completed a fourth term of residence must demonstrate that their programs of study require summer attendance.

Admission of undergraduates closes June 1, 1949.

SPECIAL STUDENTS....Applicants over twenty-four years of age who have not completed their undergraduate work and who do not intend to complete it will be admitted to the Summer Session for courses which will help their vocational or personal development.

GRADUATES....Any graduate of a recognized four-year college or university is eligible for admission to the Summer Session upon receipt by the Director of a graduate application form. On this form the applicant is asked to list his program of study. This selection of courses is designed to insure a place in classes for the student, but does not excuse him from final class registration in Barton Hall July 5; he may at that time change his selection if he finds classes to which he can be admitted. Admission to the Summer Session as a graduate student does not constitute admission to the Graduate School of Cornell University as a candidate for an advanced degree.

ADMISSION TO THE GRADUATE SCHOOL....A student planning to become a candidate for an advanced degree from Cornell University must apply for admission not only to the Director of the

Summer Session but also to the Dean of 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. For details, see below pp. 11-15.

REGISTRATION

Registration for the six-weeks Summer Session 1949 will take place Tuesday, July 5, in Barton Hall. The certificate of admission will give the hour of the day at which the registrant will be admitted. Directions for registration, changes in courses, and other announcements will be issued at the entrance. Students who for any reason have not received a certificate of admission will report to the Admissions table at Barton Hall after 9 a.m.

A University registration is required for admission to any of the exercises of the Summer Session.

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.

Undergraduates are required to register for a program of six semester hours except by special permission of the Director. A program of study must have advance approval of the student's college, either in Cornell or elsewhere. Changes of program found necessary at the time of registration must be reported to the Director and cannot be made without the approval of an officer of the institution in which the student is a candidate for a degree.

Graduates who are not enrolled in the Graduate School of Cornell University are required to register for at least four semester hours of course work and cannot register for more than six hours except by permission of the Director. A Summer Session student who is also enrolled in the Graduate School of Cornell University may, upon the recommendation of his committee chairman, register for as many as eight hours.

For courses requiring permission of the instructor, such permission will be secured by undergraduates at time of preregistration, by graduates at time of registration.

REGISTRATION FOR ATTENDANCE... Under certain circumstances teachers and other mature students, not candidates for degrees, may receive permission to register for one or more courses for attendance only. Approval of the Director and instructors concerned must be obtained on registration day. 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, if his program is light enough to allow the additional appointment. Auditors do not take part in the work of the courses which they visit, and certificates of attendance cannot be issued to them. Auditors' permits cannot be issued on registration day; they may be secured on Thursday, July 7, and later, at the Summer Session office.

LATE REGISTRATION... Students reaching Ithaca on July 6 or later will register at the following times and places: at the office of the Summer Session and at the office of the Dean of Students, between 9 a.m. and 4 p.m.; graduate students, also with the Dean of the Graduate School at his office in the Administration Building, at the same hours; owners and drivers of automobiles, also with the Safety Division Office, between 8:30 and 4:30 p.m.

UNIT COURSES... In the curriculum below, a number of courses are announced which are less than six weeks in duration. All such courses are designed to occupy the full time of the student. It is therefore impossible for a student in one of these unit courses to register for other courses or for students in the regular six-weeks session to register for a unit course. The special time and place for registration for such unit courses are announced in the course descriptions.

CHANGES IN REGISTRATION... All changes of registration after Tuesday, July 5, 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 8. When a change of registration involves enrollment in another course, approval of the instructor of the new course must be obtained.

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.

WITHDRAWAL FROM THE SUMMER SESSION... A student may arrange for withdrawal at any time by canceling 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 8.

FEES

All fees are due and payable at the Treasurer's office in the Administration Building on registration day, July 5. The last day for payment of fees without penalty is Monday, July 11.

TUITION FEES... The tuition fee for the Summer Session is \$80. Students taking unit courses for less than six weeks will pay tuition at the rate of \$16 a week. If unit courses extending through six weeks are taken, the tuition fee will be \$80. Special fees are charged for individual instruction in music, tennis, and other subjects.

MATRICULATION FEE... A matriculation fee of \$13 (which includes chest radiograph fee of \$2) is 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* booklet, which may be obtained upon request from Cornell University Official Publication, Administration Building, 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 19.

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 course descriptions.

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

Courses requiring the payment of special fees and deposits in addition to tuition are marked by a dagger prefixed to the course number.

The tuition fee of \$80 includes a \$3 Willard Straight Hall (student union) fee. Students who claim free tuition must pay this amount separately.

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

For information about fees and conditions for use of the golf course operated by the Department of Physical Education, address Mr. R. J. Kane, Schoellkopf Building.

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.

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.

VETERANS

Veterans who wish to study under Veterans Administration educational benefits for the Summer Session should observe the following instructions.

PUBLIC LAW 346 VETERANS....A veteran enrolling for the first time under educational benefits should bring with him V.A. Form 7-1953, Certificate of Eligibility. If he does not have such a certificate at the time of enrollment, he should bring full-size photostatic copies of his Discharge or Qualification Record. If married he should bring a copy of his marriage certificate from the County Clerk or the Bureau of Vital Statistics. A Church certificate, unless it bears the Church seal, must be notarized. A birth certificate, showing names of father and mother, must be submitted for a dependent child. If a dependent parent is claimed, the student should bring a notarized affidavit of dependency, V.A. Form 8-509, and a copy of his own birth certificate.

If the student has been in training under educational benefits at some other school, he should bring a Supplemental Certificate of Eligibility, V. A. Form 7-1953. If he should apply for a Supplemental Certificate after arrival at Cornell, he must present V.A. Form 7-1905e, properly endorsed by the institution where he was previously enrolled under educational benefits. The veteran should notify his present Veterans Administration Regional Office in advance to transfer his folder to the Veterans Administration Regional Office at Syracuse, New York.

Veterans in the classifications above who do not present Certificates of Eligibility *on registration day* will be expected to pay for tuition and fees, subject to such reimbursement as may become due. The Veterans Administration will pay training benefits only from the day a request for a Certificate is received in the Regional Office.

PUBLIC LAW 16 VETERANS....If a veteran has been approved, or has applied for approval under Public Law 16 (Rehabilitation), he should request his present Veterans Administration Regional Office to send his rehabilitation folder in advance to the Veterans Administration Regional Office at Syracuse, New York, with a letter explaining that he is entering training at Cornell. If the student has not yet been approved for PL 16 benefits, he should follow *all* of the above instructions for PL 346 veterans.

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 between undergraduate and graduate courses. In this announcement each course is marked immediately after the title in one of three ways:

U. 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.

G. 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.

U, G. 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.

CREDIT TOWARD DEGREES AT CORNELL UNIVERSITY. . . . Students matriculated in an undergraduate school or college of Cornell University will not be registered in the Summer Session without approval of the course registration by the appropriate officer from the following list:

Agriculture: Professor J. P. Hertel
Architecture: Secretary R. P. Lang
Arts and Sciences: Associate Dean M. L. Hulse
Engineering, Chemical: Professor C. C. Winding
Civil: Professor N. A. Christensen
Electrical: Professor H. G. Smith
Mechanical: Professor G. R. Hanselman
Home Economics: The student's counselor
Industrial and Labor Relations: Secretary Earl Brooks

This approval indicates that the school or college will accept credit in the stipulated courses as credit toward a degree.

INSTITUTIONS OTHER THAN 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. When admitted, the student will be preregistered for these approved courses. At the end of the Session, an official transcript of the Summer Session record will be sent to the institution. The transcript will show what courses have been taken, the amount of credit in semester hours, and the grades. The Cornell Summer Session can assume no responsibility for the use to be made of credits earned by students coming from other institutions.

GRADES... All grades are reported on a numerical scale from 0 to 100. If a student for medical or other important reasons is absent from the last class exercises and cannot make up the work before the last day of instruction, the instructor may report the grade as "Absent" *together with* a grade which may be recorded as the final mark if the work is not completed by January 1, 1950. No other grades, for instance, "Incomplete," are given in the Summer Session. 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 application 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 between March 15 and May 1. Though applications may be filed at any other time, the officers cannot give assurance that the application will receive the same consideration that it would receive if filed during this period. 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 A.M., M.S., M.S. in Agr., M.S. in Ed., and M.S.

in I.L.R. 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. 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 (with the exception of the M.S. in Ed. degree) may be satisfied in two ways. Each student, when applying for admission to candidacy for one of these degrees 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 in the Summer Session.

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 examination, the candidate is required to pass a final examination including 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, Education, 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 in the Summer Session. 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 the 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 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 covering the field of concentration and distributed studies.

REQUIREMENTS FOR THE DOCTOR'S DEGREE....The requirements for the Doctor's degree include a minimum of six terms of residence credit, a reading knowledge of French and German, or two other foreign languages approved by the student's committee, and tested by a special examination, successful completion of study in one major subject and two minor subjects, a thesis, and a final examination. 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 the Summer Session 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... A student who has been admitted to the Graduate School prior to the opening of the Summer Session will obtain residence credit in the Graduate School for Summer Session work if he registers both in the Summer Session and in the Graduate School. Full information and proper forms for registering in the Graduate School can be obtained at the Graduate School table in Barton Hall on Registration Day. Any student who wishes to obtain residence credit for work at the graduate level done in a Summer Session when he was not so registered must petition for a transfer of such credit. Such a petition, signed by the members of the special committee and accompanied by a transcript from the Registrar, may be submitted at any time of the year.

Students in the Graduate School who hold appointments as assistants while registered in the Summer Session cannot receive residence credit for the period of the Summer Session.

CANDIDATES IN THE SCHOOL OF EDUCATION... The School of Education, functioning as a division of the Graduate School of the University, has special jurisdiction over the degrees M.Ed. and M.S. in Ed. The same requirements for admission as those stated above apply except as to foreign languages. (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 required 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 in the Summer Session a statement, approved by his adviser, of the studies he plans to pursue.

WORK UNDER PERSONAL DIRECTION... As long as emergency allotments are in force, a candidate for a Master's or Doctor's degree who has received at least one full term of residence credit for work in

a regular academic semester may be permitted to register for work under the personal direction of a member of the faculty of the Graduate School during the summer, provided he submits a program of work approved by his special committee and by the Dean. Application for this privilege must be made before June 1.

Registration....If the request for work under personal direction is approved, the student will register only in the Graduate School, not in the Summer Session. However, if a part of his work under personal direction consists in taking a course or courses in the Summer Session curriculum, he must then register at both the office of the Graduate School and in the Summer Session.

MATRICULATION FEE....A matriculation fee of \$13 (which includes chest radiograph fee of \$2) is 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* booklet, which may be obtained upon request from Cornell University Official Publication, 336 Administration Building, should be consulted.

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 unfailing 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."

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 Safety Division Office, Administra-

tion Building, at the time of Summer Session registration, by paying a fee of \$1 and displaying, as directed, a registration sticker; (2) if under twenty-one 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, 1949, 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 as family living units are not allowed on any University property. Campus parking during class hours may be restricted to certain areas.

LIVING ACCOMMODATIONS

Rooms are available to both graduate and undergraduate men and women in University-operated housing units, as well as off-campus. Inquiries about, and applications for, University housing should be addressed to The Department of Residential Halls, Administration Building, Cornell University, Ithaca, New York. Inquiries about off-campus accommodations should be addressed to the same department, Off-Campus Housing Office.

*UNDERGRADUATE WOMEN...*All undergraduate women, and all other women under twenty-one years of age, in residence at the University, are required to live in Residential Halls for Women or in sorority houses, and to take their meals there. There will be a uniform charge of \$144 in Clara Dickson Hall for board, room, and an allowance of personal laundry for the 1949 six-weeks Summer Session.

*GRADUATE WOMEN...*A section of Clara Dickson Hall will be reserved for graduate women. The charge of \$144 for the six-weeks Summer Session will include room, an allowance of personal laundry, and twenty-one meals a week. Undergraduate closing hours will be observed.

University Cottages (One, Two, Three, and Five The Circle, and 302 Wait Avenue) will also be reserved for graduate women's housing. The rates will range from \$42 to \$57 for the six-weeks Session, depending upon the desirability and location of the room, and will include room and an allowance of personal laundry.

*DORMITORY REGULATIONS FOR WOMEN...*Both undergraduate and graduate dormitories open at 7 a.m.; undergraduate dormitories close at 11:30 p.m. Sunday through Thursday, and at 12:30 a.m. Friday and Saturday; graduate dormitories close at 12 midnight Sunday through Thursday, and at 1 a.m. Friday and Saturday.

It is understood that persons living in Residential Halls will con-

form to the house regulations made for the convenience and comfort of all students.

HEAD RESIDENTS... The Head Residents in charge of the Halls are glad to know the students, to give them whatever information they wish about the University or the town, and to advise them in cases of illness or emergency.

GRADUATE AND UNDERGRADUATE MEN... Rooms in Residential Halls for Men will be available upon application. Rooms are reserved in order of date of application. The cost of rooms ranges from \$4.25 to \$6 a week, depending upon the desirability and location of the room.

OPENING-CLOSING DATES OF DORMITORIES... All Residential Halls and Cottages for men and women will be open for occupancy Monday, July 4, at 10 a.m.; they will close at 2 p.m., Sunday, August 14. Earlier or later occupancy will not be possible.

APPLICATION FOR ROOMS... It is essential that applications for rooms in Residential Halls be mailed on regular application forms to the Office of Residential Halls. Room application forms are distributed *only* by the Office of the Summer Session *after* admission has been approved, and each student will automatically receive one with his certificate of admission to the Summer Session.

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

Women students registering for classes in dramatic production and for courses in ornithology should so indicate when making room application.

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 if the application is to receive consideration. If an assigned room 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 that occasioned by normal use, and to insure the completion of the lease. The deposit will be refunded if the applicant gives formal notice to the Manager of Residential Halls on or before June 15 (or within two weeks of applications dated later than June 2) of his intention to withdraw the application.

Checks should be drawn to the order of Cornell University.

HOUSES AND APARTMENTS... Information on houses and apartments for sub-lease may be secured from the Off-campus Housing Office. In view of the current housing shortage in Ithaca, students who

desire houses or apartments are advised to arrive in Ithaca in advance of registration in order to secure quarters.

*DINING ROOMS AND CAFETERIAS...*The dining facilities of Willard Straight Hall and the cafeteria in Martha Van Rensselaer Hall are open to both men and women students. Board may be obtained at these places or at cafeterias, dining rooms, and restaurants near the campus at approximately \$1.75 to \$2.25 a day.

*COST OF LIVING...*An estimate of the cost of living in Ithaca in the summer can be made by consulting the figures given in the preceding paragraphs. 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.

*MEANS OF SELF-SUPPORT...*Limited opportunities are available for 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. Opportunity for other types of work is also limited during the Summer Session. Applications from women students, however, should be addressed to Miss Eleanor Simonds, Office of the Dean of Men and Dean of Women. Men who want other types of work should write to Mr. Culver Smith, Office of the Dean of Men and Dean of Women.

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

LIBRARIES

The University Libraries comprise the General Library of the University and the libraries of the following Colleges and Schools: The Library of the College of Agriculture, the Library of the Agricultural Experiment Station at Geneva, the Architecture Library, the Business and Public Administration Library, the Engineering Library, the Library of the College of Home Economics, the Library of the School of Industrial and Labor Relations, the Law Library, and the Veterinary Library.

In addition there are the following special departmental libraries and laboratory collections: Agricultural Economics, Agronomy, Animal Husbandry, Apiculture, Barnes Hall, Botany, Browsing, Chemical Engineering, Chemistry, Dairy Industry, Entomology, Floriculture, Forestry, Geology, Goldwin Smith, Mathematics, Military, Music, Nutrition, Ornithology, Physics, Plant Breeding, Plant Pathology, Poultry, Regional History, and Zoology.

The usual hours of opening for the libraries during the Summer Session are 7:50 a.m. to 10 p.m. on all weekdays except Saturday, when the libraries close at 5 p.m. Certain exceptions, especially in the departmental libraries and laboratory collections, may prevail.

The general collection of reference books and documents, the chief bibliographical publications, and the principal series of academy and learned society publications are located in the University Library. Specialized reference materials will be found in the various college and departmental libraries. The Reference Department of the University Library and the librarians of the college, school, and departmental libraries are prepared to assist students in the effective use of the libraries and in the location of research materials.

The total library resources on the Ithaca campus exceed 1,300,000 volumes. The number of periodicals, transactions, and other serials currently received is over five thousand.

In the course of their development the libraries have received and have built up special collections, some of the most significant being: Architecture, American History, Slavery, Reformation, English and French Revolutions, American Civil War, History of Superstition, Spinoza, Dante, Petrarch, Rhaeto-Romanic, Egyptology and Assyriology, China, Dramatic Literature, Free-masonry, Legal Trials, Entomology, Botany, Zoology, History of Science, Icelandic, and Regional History.

Cards of admission to the stacks and to the White Historical Library are issued to graduate students for the purpose of consultation and research. A limited number of stalls and study spaces are available to graduate students upon application. The privilege of borrowing books for home use is granted to all students who comply with the library regulations.

HEALTH SERVICE

The Student Medical Clinic at 5 Central Avenue will be available for all registered Summer Session students.

Clinic Hours

Monday through Friday	9-12 a.m. 2-4:30 p.m.
Saturday	9-12 a.m.
Sunday	10-11 a.m.

A nurse will be in attendance from 12 noon until 2 p.m. Monday through Friday. 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 institution pro-

viding hospital services. 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, Ithaca 4-3211, Ext. 4518, 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 institution providing hospital services.

Hospital care will be provided for students either at the Cornell Infirmary or the Tompkins County Memorial Hospital. The specific place will be made known to students on the opening day of the Summer Session. Two days' bed nursing, and ordinary medical care, will be granted without extra charge. Emergency surgical care will also be provided. Emergency surgical care is defined as surgical procedures which, in the opinion of the Medical Director, are necessary for the immediate welfare of the patient. Rates in a hospital for registered students beyond the two day exemption period will be \$5 a day.

If a student, while in the hospital, 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 in the city of Ithaca rather than consult the Clinic. In either case, the cost of this service is not included in the health fee.

COUNSELING SERVICES

The Office of the Dean of Men and Dean of Women is located on the first floor of the Administration Building. This office maintains:

PART-TIME EMPLOYMENT...A current list of part-time jobs for those who find it necessary to work for board, room, or personal expenses. Though this office cannot guarantee part-time work for all applicants, it refers qualified students to prospective employers.

INDIVIDUAL COUNSELING...A trained guidance and counseling staff for all students who feel a need for social, personal, educational, or vocational counseling.

TESTING...In cooperation with the University Testing Service, administration of appropriate tests if in the counseling process need for interest or aptitude testing is indicated.

VOCATIONAL INFORMATION...A vocational information library.

COUNSELING FOR FOREIGN STUDENTS...A Counselor to For-

eign 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 help them find suitable living quarters and assist them with introductions. Letters should be addressed to: Counselor to Foreign Students, Administration Building, Cornell University, Ithaca, New York.

PROGRAM OF EXTRACURRICULAR ACTIVITIES

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. . . . A public lecture, open to all Summer Session students, is given on selected Wednesday evenings of the Session. Both non-resident lecturers and members of the faculty take part in the series, and the subjects are chosen for their general interest and timeliness. In 1948 the lecturers and their topics were:

Frederick Osborn, Deputy United States Representative, Atomic Energy Commission. "Atomic Energy and International Policy."

Robert E. Cushman, Professor of Government, Cornell University. "National Security and Civil Liberty."

Paul Zucker, Professor of Architecture and Art, Cooper Union, and Lecturer, New York School for Social Research, New York City. "Trends of Modern Art, a Comparative Survey."

Afternoon series. In the late afternoon and on Monday evenings at times to be announced, 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 10 to August 7 inclusive.

CHORUS...All men and women interested in singing in a chorus may report to Miss Squire at 7:15 p.m. on July 5, in the choir loft of Sage Chapel, for discussion of plans and decisions on a suitable schedule of rehearsals.

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.

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 1948 the series included:

"The Doctor in Spite of Himself" by Molière

"Springtime for Henry" by Benn Levy

Four one-act plays.

"Ladies in Retirement" by Edward Percy and Reginald Denham

The plays of the Summer Theatre Company are under the general direction of Professors Stainton, Drummond, and Albright, assisted by other members of the Direction Staff. Regularly enrolled members of the classes in Dramatic Production may compete for places in the casts and production staffs. Detailed announcements will be made in the various classes.

FILMS...Noteworthy European and American art and documentary films are presented weekly by the Summer Theatre. Admission is charged. In 1948 the following films were shown:

"Henry V"

"Shoe Shine"

"Children of Paradise"

"Private Life of Henry VIII"

"The Last Chance"

"To Live in Peace"

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, open houses, 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.

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.

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. J. Kane, Schoellkopf Building, Cornell University, Ithaca, New York. 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.

The Curriculum

COURSES OF INSTRUCTION are listed by departmental subheadings under fields of instruction. For offerings in particular subjects, consult the Index. Because of demands which may be placed upon the instructing staff, it may be necessary to substitute 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.

COURSES WITH FEES ATTACHED...Courses requiring laboratory or other fees are marked by daggers.

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 9, 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 supplementary announcement which will be furnished on registration day.

SCHEDULE OF EXAMINATIONS...With a few exceptions, examinations will be held on Friday, August 12, and Saturday, August 13, at hours indicated by the schedule below; in the exceptional cases, the examination will be held on Thursday, August 11, 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, Economics S 104 meets daily at 10 and 11; the examination will be held on Friday at 10:30. 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.

FINE ARTS

ART HISTORY AND APPRECIATION

S 102. *INTRODUCTION TO RENAISSANCE AND MODERN ART*...U; 2 hrs. 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 507. *TWENTIETH CENTURY ART*...U,G; 2 hrs. Prerequisite S 101 or 102 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 300. *PAINTING AND COMPOSITION*...U,G; 2 hrs. Daily except Saturday 8-10. Associate Professor DALY.

Studio work for beginners and intermediate students. Principles of pictorial composition stressed in class work that consists of interpretative drawing and painting of still life and landscape. Media: pencil, charcoal, gouache, and oils.

S 302. *PAINTING AND COMPOSITION*...U,G; 2 to 6 hrs. Daily except Saturday 10-12. Registration by permission of the instructor. Associate Professor DALY.

For students with considerable experience in painting.

S 324. *WORKSHOP FOR THE ART TEACHER*...G; 2 hrs. Daily except Saturday 10-12. Associate Professor DALY.

Combined seminar and studio course. Problems of materials and methods for teaching art in elementary and secondary schools; for those who have teaching experience as well as those who are teaching art for the first time. Individual needs are considered and opportunity for discussion is provided. Part of the course is given to planning art curricula, and to methods of presentation and emphasis.

MUSIC

S 101. *THE ART OF MUSIC*...U; 2 hrs. Daily except Saturday 11. Associate Professor HULL.

An approach to the understanding and rational enjoyment of the art of music, offered especially for students who have had no technical training in the subject. Most of the outside work consists of listening to phonograph records.

S 377. *SEMINAR IN MUSICOLOGY*...G; 2 hrs. Prerequisites, a knowledge of music theory and general music history, and some skill in applied music and score reading; also (depending on the topic chosen) a reading knowledge of the requisite foreign language or languages. Hours to be arranged. Associate Professor HULL.

A particular topic of study will be assigned to each student after consultation.

S 021. *INFORMAL STUDY*...U. Credit and time to be arranged after consultation. Assistant Professor CAMPBELL.

†S 401. *PIANO*...U; 1 hr. (this credit may be counted toward a Cornell degree only by those students who have at least two hours credit in theoretical or historical music courses). Prerequisite, consent of the instructor. Hours to be arranged. Miss SQUIRE.

For two half-hour lessons weekly throughout the Summer Session, a special fee of \$24 is charged. Fee payable at the office of the Department of Music at time of registration with the instructor.

CHORUS...All men and women interested in singing in a chorus may report to Miss Squire at 7:15 p. m. on July 5, in the choir loft of Sage Chapel for discussion of plans and decisions on a suitable schedule of rehearsals.

SUMMER SESSION ORCHESTRA...Applications should be made to Assistant Professor Campbell, 320 Wait Avenue, during registration period or at the first rehearsal which will be held Wednesday, July 6 in Martha Van Rensselaer Auditorium at 7 p.m.

ENGLISH, JOURNALISM, SPEECH AND DRAMATICS

ENGLISH

S 301. *INTRODUCTION TO THE DRAMA*...U,G; 2 hrs. Daily except Saturday 9. Assistant Professor DOWNER.

Representative plays from Greek to recent times.

S 302. *MODERN DRAMA*...U,G; 2 hrs. Daily except Saturday 12. Assistant Professor DOWNER.

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

S 310. *THE METAPHYSICALS AND THE MODERNS*...U,G; 2 hrs. Daily except Saturday 11. Professor BALD.

The metaphysical poets from Donne to Marvell, with emphasis on their influence on twentieth-century poetry and criticism.

S 323. *POETRY OF THE VICTORIAN AGE*...U,G; 2 hrs. Daily except Saturday 10. Associate Professor FRENCH.

Poems of Browning, Arnold, and others.

S 330. *AMERICAN LITERATURE SINCE 1860*...U,G; 2 hrs. Daily except Saturday 11. Professor MYERS.

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

S 335. *THE MODERN AMERICAN NOVEL*...U,G; 2 hrs. Daily except Saturday 8. Mr. ELIAS.

Six representative American novelists from Dreiser to Hemingway.

S 339. *THE SHORT STORY*...U,G; 2 hrs. Daily except Saturday 12. Professor SALE.

The short story as a literary form, accompanied by the writing of critical appraisals.

S 373. *MILTON*...U,G; 2 hrs. Daily except Saturday 10. Professor DAICHES.

Milton's poetry and intellectual environment, with particular emphasis on *Paradise Lost*.

S 379. *HAWTHORNE AND MELVILLE*...U,G; 2 hrs. Daily except Saturday 10. Mr. ELIAS.

An intensive study of selected writings by two major American novelists.

S 382. *THE ENGLISH LANGUAGE*...U,G; 2 hrs. Daily except Saturday 12. Associate Professor FRENCH.

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

S 385. *NARRATIVE WRITING*...U,G; 2 hrs. Daily except Saturday 8, and conferences to be arranged. Assistant Professor HATHAWAY.

Theory and practice in the writing of fiction and allied narrative forms.

S 391. *WRITING WORKSHOP*...U,G; 2 hrs. Daily except Saturday 9 and conferences to be arranged. Assistant Professor HATHAWAY.

Primarily for graduates but open to qualified undergraduates. Designed for writers who need assistance with specific projects or problems in writing. Round-table discussions and individual conferences.

S 402. *PRINCIPLES OF LITERARY CRITICISM*...U,G; 2 hrs. Daily except Saturday 11. Professor DAICHES.

Selected critical works from the Renaissance to the present day, with the emphasis on the criticism of the last fifty years.

S 411. *THE TEACHING OF THE ENGLISH LANGUAGE AND COMPOSITION*...U,G; 2 hrs. Tuesday and Thursday 2-4. Professor SALE.

For teachers and prospective teachers, a study of the work of modern linguists, grammarians, and rhetoricians.

S 469. *SHAKESPEARE'S COMEDIES*...U,G; 2 hrs. Daily except Saturday 9. Professor BALD.

Shakespeare's dramatic art as illustrated in his comedies.

S 642. *SEMINAR: AMERICAN LITERATURE*...G; 2 hrs. Monday and Wednesday 2-4. Professor MYERS.

The poetry of Walt Whitman. The instructor's consent is necessary before enrolling.

S 903. *SPECIAL TOPICS FOR INVESTIGATION*...G; 2 hrs. Conferences to be arranged.

For graduate students writing master's essays or engaging in special research. The course is administered by various members of the staff; students who wish to be put in touch with a suitable director for the work they have in mind may write to or consult Professor W. H. FRENCH.

JOURNALISM

S 15. *ELEMENTS OF JOURNALISM*...U,G; 2 hrs. Daily except Saturday 11. Professor Bristow ADAMS.

The principles of journalistic writing, including news, editorials, criticism, reports, and news features.

S 122. *SPECIAL ARTICLES*...U,G; 2 hrs. Daily except Saturday 9. Professor Bristow ADAMS.

News features, articles, and feature pictures.

SPEECH AND DRAMA

S 101 *PUBLIC SPEAKING*...U; 2 hrs. Daily except Saturday 11. Mr. CARSON.

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 205. *DISCUSSION*...U,G; 2 hrs. Daily except Saturday 9. Mr. CARSON.

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 221. *FORMS OF PUBLIC ADDRESS*...U,G; 2 hrs. Daily except Saturday 10. Professor WICHELS.

A survey of the types of public address employed in modern democracies. Readings, selected chiefly from the works of Burke, Webster, Lincoln, Churchill, and Roosevelt; some practice in composition and delivery.

S 287. *THEORIES OF PUBLIC ADDRESS*...U,G; 2 hrs. Daily except Saturday 12. Professor WICHELS.

A survey of theories, ancient and modern, concerning the function and the types of public address, the nature of persuasion, and the speaker's problems of preparation, structure, style, and delivery. Lectures, readings, and reports.

S 290. *THESES AND SPECIAL PROBLEMS IN PUBLIC ADDRESS*...G; 2 or more hrs. Professor WICHELS.

Required of regularly registered summer session graduates working on theses. Open to other graduates prepared for the independent study of special topics in rhetoric and public speaking.

S 333. *TEACHERS' COURSE IN PHONETICS AND SPEECH TRAINING*...U,G; 2 hrs. Daily except Saturday 9. Professor THOMAS.

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

S 351 *PRINCIPLES OF SPEECH CORRECTION*...U,G; 2 hrs. Daily except Saturday 10. Professor THOMAS.

Principles governing change of speech habits; causes, classification, and diagnosis of defects; function and organization of the clinic.

S 390. *THESES AND SPECIAL PROBLEMS IN SPEECH TRAINING AND PHONETICS*...G; 2 or more hrs. Professor THOMAS.

Required of regularly registered summer session graduates working on theses. Open to other graduates prepared for the independent study of special topics in speech training and phonetics.

S 401. *DRAMATIC PRODUCTION: DIRECTION*...U,G; 2 hrs. 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 421. *DRAMATIC INTERPRETATION*...U,G; 2 hrs. M W F 3-5. Associate Professor ALBRIGHT.

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

S 433. *THEATRE PRACTICE*...U,G; 2 or 4 hrs. Hours to be arranged. Mr. JEWETT and the Theatre STAFF.

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

S 475. *BACKGROUNDS OF MODERN STAGE PRESENTATION*...U,G; 2 hrs. Daily except Saturday 2. 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 480. *THE MOTION PICTURE: A SURVEY*...U,G; 2 hrs. Daily except Saturday 12 and a weekly projection period to be arranged. 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.

Numerous films will be viewed. Students are required to attend the film programs of the Summer Theatre.

S 490. *THESES AND SPECIAL PROBLEMS IN DRAMA AND THE THEATRE*...G; 2 or more hrs. Professors DRUMMOND, STANTON, and ALBRIGHT.

Required of regularly registered summer session 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. Professor THOMAS. By appointment.

LANGUAGES

CLASSICS

S 1. *LATIN LITERATURE IN TRANSLATION*...U,G; 2 hrs. Daily except Saturday 10. Assistant Professor BASSETT.

A study of Latin literature in the best available translations; designed to give a comprehensive view of the successive literary movements and of the leading characteristics of the Roman mind in literature. Literary types will be emphasized, and also important but less familiar authors.

S 2. *THE ROMAN EPIC AND ROMAN HISTORICAL WRITING*...U,G; 2 hrs. Daily except Saturday 11. Assistant Professor BASSETT.

Readings, in Latin, in Caesar's *Civil War* and in Lucan's *Pharsalia*; further studies in the post-Virgilian epic.

S 3. *THESES AND INFORMAL WORK*...G; credit by arrangement; total credit for thesis may not exceed six hours. Assistant Professor BASSETT.

DIVISION OF MODERN LANGUAGES

Professor J. M. Cowan; Associate Professors F. B. Agard, R. A. Hall, Jr., and W. G. Moulton; Assistant Professors G. H. Fairbanks and C. F. Hockett.

The system of course numbering is the same for all languages offered by the Division. Courses S 101 and S 102 in a given language aim at bringing the student to a level of achievement sufficient to enable him to pass the Proficiency Examination and thus fulfill the language requirement for graduation. These courses are the equivalent of courses 101 and 102 offered in the regular academic year.

Courses S 151 and S 152 are designed to assist graduate students to prepare themselves for the reading examinations required by the Graduate School. Students with no previous experience with the language will register for S 151, those with roughly the equivalent of one year of collegiate work or two years of high school work will register for S 152. It will be possible to shift graduate students back and forth in these courses on the basis of their ability and performance. Each course is to be considered as a full-time program by the student and the equivalent of six hours of undergraduate credit will be allowed for this work. In actual practice those registered in S 151 or S 152 will participate in the oral drill as set up for S 101 or S 102, but they will be given special reading and outside assignments consonant with their needs and abilities.

Course S 191 is a training course for teachers of modern foreign languages. Those entering this course must elect a language in which they have *not* had extensive previous experience. The bulk of the work consists in learning a new language and studying this process from the point of view of the learner. Those registered in

S 191 will participate in the oral drill as set up for S 101. They will be given special readings, assignments, and lectures covering all phases of modern propaedeutics and pedagogy.

All courses except S 191 constitute a full academic program of six credit hours and consist of 20 hours of instruction each week at periods to be assigned. Registration for these courses will be closed when the capacity of the sections has been reached.

S 101. *FRENCH*...U; 6 hrs. Associate Professor Hall and assistants.

S 102. *FRENCH*...U; 6 hrs. Prerequisite, French 101 or equivalent. Associate Professor Hall and assistants.

S 151. *FRENCH*...For graduate students acquiring reading proficiency; 6 hrs. Associate Professor Hall and assistants.

S 152. *FRENCH*...For graduate students acquiring reading proficiency; 6 hrs. Associate Professor Hall and assistants.

S 191. *FRENCH*...U,G; 4 hrs. Associate Professor Hall and assistants.

S 101. *GERMAN*...U; 6 hrs. Associate Professor Moulton and assistants.

S 102. *GERMAN*...U; 6 hrs. Prerequisite, German 101 or equivalent. Associate Professor Moulton and assistants.

S 151. *GERMAN*...For graduate students acquiring reading proficiency; 6 hrs. Associate Professor Moulton and assistants.

S 152. *GERMAN*...For graduate students acquiring reading proficiency; 6 hrs. Associate Professor Moulton and assistants.

S 191. *GERMAN*...U,G; 4 hrs. Associate Professor Moulton and assistants.

S 101. *SPANISH*...U; 6 hrs. Associate Professor Agard and assistants.

S 102. *SPANISH*...U; 6 hrs. Prerequisite, Spanish 101 or equivalent. Associate Professor Agard and assistants.

S 191. *SPANISH*...U,G; 4 hrs. Associate Professor Agard and assistants.

ROMANCE LITERATURE

S 504. *SPANISH-AMERICAN LITERATURE OF THE NINETEENTH AND TWENTIETH CENTURIES*...U,G; 2 hrs. Daily except Saturday 10. Professor DALE.

Lectures in Spanish, together with reading and critical analysis of the works of the outstanding authors of the period. This course omits the study of the novel.

S 521. *THE MODERN SPANISH-AMERICAN NOVEL*...U,G; 2 hrs. Daily except Saturday 11. Professor DALE.

Lectures in Spanish, together with reading of representative novels and critical study of the works of at least one Spanish-American novelist.

S 60. *SPECIAL TOPICS*...G; 1 or 2 hrs. Consult Professor DALE.

PSYCHOLOGY AND PHILOSOPHY

PSYCHOLOGY

S 101. *ELEMENTARY PSYCHOLOGY*...U; 2 hrs. Daily except Saturday 9. Assistant Professor MARCUSE.

This course deals with the basic problems and principles of human psychology and is designed as a general foundation for the study of experimental, social, animal, and child psychology, for psychotechnology and for the psychology of the abnormal.

S 102. *FIELDS OF PSYCHOLOGY*...U; 2 hrs. Daily except Saturday 11. Prerequisite S 101 or equivalent. Assistant Professor MARCUSE.

A survey of the fields of differential, abnormal, animal, genetic, and social psychology.

S 209. *SOCIAL PSYCHOLOGY*...U,G; 2 hrs. Daily except Saturday 12. Prerequisite S 101 or equivalent. Professor ADAMS.

Nature and growth of socialization; analysis and measurement of social attitudes; psychological factors in the formation and behavior of social groups.

S 309. *EXPERIMENTAL GROUP DYNAMICS*...U,G; 2 hrs. TTh 1-3. Open to graduate and advanced undergraduate students. Professor BRONFENBRENNER.

A study of group formation, structure, and change in the light of theory and research in personality and interpersonal relations. The class will utilize itself as the object of laboratory study. Enrollment limited to 20 students.

S 520. *PSYCHOLOGY OF MOTIVATION*...U; 2 hrs. Daily except Saturday 10. Prerequisite S 101 or equivalent. Professor BRONFENBRENNER.

A systematic study of the initiation, direction, and regulation of behavior.

S 575. *CURRENT PSYCHOLOGICAL THEORY*...U,G; 2 hrs. MW 2-4. Open to graduate and advanced undergraduate students. Professor ADAMS.

Systematic examination of the major points of view in recent and contemporary psychology.

S 607. *MENTAL MEASUREMENTS*...U,G; 2 or 3 hrs. With consent of the instructor, this course may be taken without observations for two hours credit. Daily except Saturday 9; observational hours to be arranged. Professor ABELSON.

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, reading, and observations of individual testing.

S 612. *PSYCHOLOGY OF EXCEPTIONAL CHILDREN*...G (U by permission); 2 hrs. Daily except Saturday 11. Professor ABELSON.

Designed to give a scientific understanding of children who deviate from the usual: the gifted, the feeble-minded, the delinquent, those having special abilities and 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 measurement may be admitted only with approval of the instructor.

MENTAL HYGIENE

S 1. *MENTAL HYGIENE*...U,G; 2 hrs. Daily except Saturday 9 or 11. Professor 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 of mental illness and their prevention.

PHILOSOPHY

S 103. *LOGIC*...U; 2 hrs. Daily except Saturday 9. Professor BOUWSMA.

An elementary study of valid inference, inductive method, and the causes of fallacy.

S 221. *ETHICS*...U; 2 hrs. Daily except Saturday 11. Professor BOUWSMA.

A study of the designs which men have elaborated for arranging their lives together, and the considerations urged in support of such designs; emphasis on current issues.

SOCIAL SCIENCE

ECONOMICS

S 104. *ELEMENTS OF ECONOMICS*...U,G; 4 hrs. Daily except Saturday 10-12. Mr. DYMOND.

A general introductory survey of the economic system, with special reference to the function of price. This course or its equivalent is prerequisite to all other courses in economics.

S 203. *MONEY, CURRENCY AND BANKING*...U,G; 2 hrs. Prerequisite, Economics 101 or equivalent. Daily except Saturday 9. Professor REED.

A study of our currency and banking system for the primary purpose of revealing the nature of monetary forces operating in our economy.

S 210. *COMMERCIAL BANKING*...U,G; 2 hrs. Prerequisite, Economics 203 (may be taken concurrently). Daily except Saturday at 11. Professor REED.

A case study in bank administration. Problems to be treated stress loan-granting, investment policies and relationships with the supervising authorities.

S 315. *ECONOMIC PLANNING IN A CAPITALIST SOCIETY*...U,G; 2 hrs. Prerequisite, Economics 101 or equivalent. Daily except Saturday 8. Assistant Professor TYNDALL.

A study of the possibilities and limitations of economic planning in a capitalist society. Main emphasis will be on national and regional planning.

S 340. *COMPARATIVE ECONOMIC SYSTEMS*...U,G; 2 hrs. Prerequisite, Economics 101 or equivalent. Daily except Saturday 9. Associate Professor ADAMS.

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

S 505. *CURRENT FISCAL PROBLEMS*...U,G; 2 hrs. Prerequisite, Economics 101 or equivalent. Daily except Saturday 10. Assistant Professor TYNDALL.

An analysis of contemporary problems in the fields of taxation, governmental expenditure, and debt management.

S 901. *INTERMEDIATE ECONOMIC THEORY*...U,G; 2 hrs. Prerequisite, Economics 101 or equivalent. Daily except Saturday 10. Associate Professor ADAMS.

An analysis of the pricing processes in a free enterprise economy under varying competitive conditions, and their role in the allocation of productive resources and the functional distribution of the national income.

GEOGRAPHY

See GEOLOGY AND GEOGRAPHY.

GOVERNMENT

S 101. *AMERICAN NATIONAL GOVERNMENT*...U,G; 2 hrs. Daily except Saturday 9. Assistant Professor ROSSITER.

A general survey of the facts and theories of American government and politics. Particular attention will be devoted to documentary materials that illustrate current problems in the organization, powers, practical operation, and reform of the various branches of the government.

S 216. *THE AMERICAN PRESIDENCY*...U,G; 2 hrs. Prerequisite, a course in American national government. Daily except Saturday 11. Assistant Professor ROSSITER.

A study of the presidential office; the constitutional, administrative, and political position of the President; relation to Congress; current problems and proposals of reform.

S 411. *INTERNATIONAL POLITICS*...U,G; 2 hrs. Daily except Saturday 8. Professor BRIGGS.

An analysis of the character of national power; of the motive forces of world politics and the struggle for power and peace in the twentieth century. Text: Hans J. Morgenthau, *Politics Among Nations: The Struggle for Power and Peace* (Knopf, 1948, \$4.25).

S 414. *INTERNATIONAL ORGANIZATION*...U,G; 2 hrs. Daily except Saturday 10. Professor BRIGGS.

The origin, structure, and operation of the United Nations and its specialized agencies; an analysis of international governmental procedures and institutions for the performance of legislative, executive, administrative, and judicial functions in international relations.

HISTORY

S 148. *RUSSIA IN THE TWENTIETH CENTURY*...U,G; 2 hrs. Daily except Saturday 8. Associate Professor SZEFTTEL.

The Revolutions of 1905 and 1917; economic, social, political, and cultural history under the Soviet regime.

S 419. *APPROACH OF THE REVOLUTION IN FRANCE, 1763-1789*...U,G; 2 hrs. Daily except Saturday 9. Assistant Professor PUGH.

The struggle for reform in pre-revolutionary France in relation to social, economic, political, and religious conditions; feudal survivals in France as compared with other continental countries, the economic changes in 18th century France, the struggle between the crown, the privileged classes and the bourgeoisie, and the ideas of the *philosophes* as they reflected these struggles.

S 423. *WESTERN EUROPE FROM THE FRENCH REVOLUTION TO 1871*...U,G; 2 hrs. Daily except Saturday 11. Assistant Professor PUGH.

Emphasis will be given to social conflicts and theories; liberalism and its influence in the Revolutionary period, reaction and the appeal to tradition, the social effects of the industrial revolution, individualist and socialist theories, the revolutions of 1830 and 1848, and the triumph of nationalism.

S 451. *THE SLAVIC PEOPLES FROM 1815 TO 1914*...U,G; 2 hrs. Daily except Saturday 10. Associate Professor SZEFTTEL.

The Poles, Czechs, Slovaks, and the Balkan Slavs; their fight for national survival; influences issuing from Russian Pan Slavism, German nationalism, and the Turkish Empire.

S 517. *INTELLECTUAL AND SOCIAL HISTORY OF ENGLAND, VICTORIAN PERIOD*...U,G; 2 hrs. Daily except Saturday 8. Professor MARCHAM.

A study of the interrelationship of institutions and ideas during the period of the Industrial Revolution and Constitutional Reform. Text: Bowyer and Brooks, *The Victorian Age: Prose, Poetry, and Drama*, Crofts and Company, 1947.

S 519. *THE BRITISH COMMONWEALTH AND EMPIRE IN THE NINETEENTH AND TWENTIETH CENTURIES*...U,G; 2 hrs. Daily except Saturday 10. Professor MARCHAM.

The role of the British peoples in recent world affairs. Special attention will be given to the government, economic activities, and geography of Great Britain, Canada, and Australia as they relate to the problems and policies of the United States.

S 712. *THE AGE OF WASHINGTON, 1763-1800*...U,G; 2 hrs. Daily except Saturday 9. Professor NETTELS.

The struggle for American independence, the making of the Constitution, the founding of the Federal Government, and the shaping of national policies.

S 717. *AMERICAN BIOGRAPHY*...U,G; 2 hrs. Daily except Saturday 11. Professor NETTELS.

Studies in the work and influence of leaders in various fields of activity who are representatives of main factors or trends in American history.

SOCIOLOGY

S 101. *INTRODUCTION TO THE STUDY OF SOCIETY*...U,G; 2 hrs. Daily except Saturday 9. Assistant Professor BARRON.

An introduction to the study of societies as interrelated systems; selected major problems of contemporary American society as seen in the context of our own social system; social factors in personality formation.

S 103. *CONTEMPORARY SOCIAL PROBLEMS*...U,G; 2 hrs. Daily except Saturday 10. Assistant Professor BARRON.

Major social problems of modern urban society viewed in terms of the factors underlying social disorganization and individual maladjustment.

†A 12. *RURAL SOCIOLOGY*...U,G; 3 hrs. Daily except Saturday 7:30-8:50. Assistant Professor REEDER.

This course considers the principles of rural sociology and their application to rural community problems. It is designed especially for students who expect to live in a rural community and work with rural people. Fee for materials, \$1.

†A 31. *PRINCIPLES OF GROUP BEHAVIOR*...U,G; 2 hrs. Daily except Saturday 8. Associate Professor CLARK.

Theory and principles of social psychology and group dynamics applied to intra-group and inter-group formation, structure, and functioning. Fee for materials, \$1.50.

†A 32. *TECHNIQUES OF DEALING WITH GROUPS*...U,G; 2 hrs. M T W Th 11-12:30. Associate Professor CLARK.

Application of recent developments in social psychology and group dynamics to working with various types of groups, such as committees, conferences, discussion groups, community councils, etc. Special emphasis will be placed on laboratory exercise in leadership, leader-member relations, productivity and evaluation of group processes. Fee for materials, \$1.50.

A 44. *SCHOOL AND COMMUNITY RELATIONS*...U,G; 2 hrs. Daily except Saturday 10. Assistant Professor REEDER.

A study of the school as a part of the community. Some of the problems which will be dealt with are: making the school a vital part in the life of the community, using the community as a laboratory, preparing students for effective community membership, and working with other organizations in the community.

†A 113. *RURAL SOCIAL PROBLEMS AND PUBLIC POLICY*...U,G; 2 hrs. Daily except Saturday 9. Associate Professor LARSON.

An examination of the social aspects of selected current problems in American rural life, including low-income groups and rehabilitation, farm tenancy, farm labor, health facilities, welfare, education, population pressure, levels of living, and technological change. Action taken to meet these problems will be described and analyzed. Public policies proposed and in operation will be evaluated in relation to implications for rural society. Fee for materials, \$1.

A 126. *SOCIAL SERVICES TO INDIVIDUALS*...U,G; 2 hrs. Daily except Saturday 11. Assistant Professor TAIETZ.

A study of the attitudes and behavior commonly encountered in helping others; the role of emotional factors in influencing thinking and action; principles and methods in interviewing. The case material in the course will be selected for its usefulness to teachers, school administrators, social workers, public health nurses, and other professional personnel.

INDUSTRIAL AND LABOR RELATIONS

I 10. *SURVEY OF INDUSTRIAL AND LABOR RELATIONS*...U; 2 hrs. Daily except Saturday 9. Assistant Professor FERGUSON.

A survey course which will include an analysis of the major problems in industrial and labor relations: labor union history, organization, and operation; labor market analysis and employment practices; industrial and labor legislation and social security; personnel management and human relations in industry; collective bargaining, mediation, and arbitration; the rights and responsibilities of employers and employees; the major governmental agencies concerned with industrial and labor relations.

I 21. *ECONOMICS OF WAGES AND EMPLOYMENT*...U,G; 2 hrs. Daily except Saturday 11. Prerequisite, introductory course in economics. Assistant Professor FERGUSON.

A general analysis of the economic factors in the determination of wages and the terms of employment. Major aspects of the following topics will be studied: composition of the labor force; trends in money and real earnings and national income; theories of wages; trade union policies and practices and their effects upon wages and employment; economic aspects of governmental regulation of wages and hours; employment theories and policies.

I 42. *LABOR HISTORY*...U,G; 2 hrs. Prerequisites, introductory courses in economics and American history. Daily except Saturday 10. Professor OTIS.

The historical development of American labor movements before the Civil War is surveyed generally. Special emphasis is placed upon the rise of organized labor movements in the United States since 1865. Problems which faced such organizations as the Knights of Labor, the AFL and the CIO are discussed in detail, along with various theories of the labor movement which help to explain historical developments. More than two-thirds of the course is devoted to a study of the history and objectives of representative international unions within the AFL and the CIO. The problems of unorganized labor are also analyzed.

I 44. *HUMAN RELATIONS IN INDUSTRY*...U,G; 2 hrs. Prerequisites, introductory courses in psychology and sociology. Daily except Saturday 12. Professor SMITH.

An analysis and appraisal of the social and psychological factors important in human relations in industry. This course is designed to acquaint the student with the field and with methods for approaching the human problems he is likely to encounter. Topics include orientation in terms of natural and social science, the equilibrium of the individual, the equilibrium of the group, union-management relations, and factors affecting productivity.

I 45. *PERSONNEL MANAGEMENT*...U,G; 2 hrs. Daily except Saturday 8. Assistant Professor BROPHY.

A study of the ways of working with employees to insure the best use of individual capacities, the greatest amount of personal and group satisfaction, and maximum service to the employing organization. Principles and methods of personnel organization, recruitment, selection, training, hours and wages, working conditions, special services, and personnel research are considered.

I 45A. *PERSONNEL MANAGEMENT*...U,G; 3 hrs. Daily except Saturday 1-3. Professor BROOKS.

Enrollment in this course is expected to be limited to persons who are engaged in personnel management or in industrial relations work, who in most instances have had less than one year of specialized experience in such work, and who desire an opportunity to broaden their education in this field. Consideration will be given to case studies and practical problems of personnel management including recruit-

ment, selection, placement, training, compensation, rating, transfer, promotion, separation, disciplinary actions, grievances, employee health and safety, employee services, and retirement plans. Use will be made of outside specialists.

I 48. *AUDIO-VISUAL METHODS*...U,G; 2 hrs. Daily except Saturday 8. Assistant Professor JEHRING.

A discussion of the effectiveness of audio-visual methods as a means of communication. Training is given in the preparation and proper use of audio-visual materials and devices. Stress is placed on the contributions of audio-visual methods to the solution of problems of mass communication.

I 59. *LABOR RELATIONS LAW AND LEGISLATION*...U,G; 2 hrs. Daily except Saturday 12. Professor OTIS.

This course will consider the common and statute law background of labor relations. The significant decisions of the courts in relation to the activities of labor unions will be considered. Attention will be given to the Sherman Anti-Trust Act, the Clayton Act, the National Labor Relations Act, the Railway Labor Act, and the Labor-Management Relations Act.

I 68. *PUBLIC RELATIONS*...U,G; 2 hrs. Daily except Saturday 9. Assistant Professor HYATT.

An analysis of the major types of public relations activities of industrial and labor organizations. A critical appraisal will be made of policies and methods for the effective presentation of their position to their own memberships, to government agencies, and to the public. Each student will prepare a case study in public relations for an industrial or labor organization.

INSTITUTES

In addition to the regular summer courses, the School will sponsor several institutes in the fields of Personnel Management, Industrial Education, Industrial Safety, and Social Security, varying in length from one to two weeks. Details of these institutes will be announced by February 15, 1949 and a copy of the announcement may be obtained from the School of Industrial and Labor Relations.

AGRICULTURE

See also BIOLOGICAL SCIENCES.

AGRICULTURAL ECONOMICS

†A 4. *RURAL ECONOMICS*...U,G; 3 hrs. Lectures daily except Saturday 10. Field trips Thursday 2-6. Professor BRATTON.

This course is designed to give persons who have not had formal training in agricultural economics but who plan to work in rural areas a general knowledge of the economic aspects of farming and rural life. Includes a study of the economic characteristics of the business of farming and the family farm; types of farming; economic differences in land; what makes a farm pay; marketing farm products and the function of agricultural cooperatives; economic and social agencies serving the rural community; young people in farming; and rural problems and the development of rural policies. Approximate cost for transportation \$5. Fee for materials, \$2.

†A 115. *AGRICULTURAL AND INDUSTRIAL PRICES*...U,G; 3 hrs. Lectures daily except Saturday 8; laboratory, W 2-4. Assistant Professor PAARLBERG.

Primary emphasis will be on the relationship between movements of prices and production, employment, and other indexes of economic conditions. Some attention will be given to the causes of price level changes, and to the possibility of diminishing their fluctuations. Fee for materials, \$2.

†A 141. *PRINCIPLES AND PROBLEMS IN AGRICULTURAL MARKETING*...U,G; 3 hrs. Lectures daily except Saturday 9; laboratory, Th 2-4. Professor PIERCE.

Characteristics of agricultural supply and consumer demand; marketing services required, and the cost; possibilities of more efficient marketing. Examination of the methods of marketing a number of agricultural products. Approximate cost of transportation on field trips \$5. Fee for materials, \$2.

†A 181. *LAND ECONOMICS*...U,G; 3 hrs. Lectures daily except Saturday 11; laboratory, M 2-4. Associate Professor CARTER.

The fundamental problem toward which the material will be directed is how to obtain the best use of land in the existing stage of technological development. Physical characteristics of land as related to use; the application of economic principles; the actual use of land; desirable modifications; methods of altering the use of land. Approximate cost of transportation on field trips, \$5. Fee for materials, \$2.

A 241. *RESEARCH METHODS IN AGRICULTURAL MARKETING*...G; 1 hr. Discussion period, F 2-4. Professor PIERCE.

An examination of research methods and problems in agricultural marketing. A number of research studies will be examined for the purpose of analyzing the techniques employed and appraising the results.

AGRICULTURAL ENGINEERING

†A 101. *ELECTRICITY AND ELECTRICAL EQUIPMENT FOR THE FARM AND THE HOME*...U,G; 2 hrs. Lectures, M W F 8; Laboratory, T Th 2-4:30. Professor WRIGHT.

A study of the principles of electricity, electrical wiring and appliances, including motors, with emphasis on the proper uses of these on the farm and in the home. Laboratory fee \$3.

†A 104. *RURAL WATER SUPPLY AND SEWAGE DISPOSAL*...U,G; 2 hrs. Lectures, M W F 11; Laboratory, M W 2-4:30. Professor WRIGHT.

A study of methods and problems of obtaining adequate water supply in rural areas, including developing sources, water pumping, and plumbing systems. A brief study will be made of approved systems for sewage disposal. Laboratory fee, \$3.

†A 103. *FIELD MACHINERY*...U,G; 3 hrs. Prerequisite Physics. Lectures, Daily except Saturday 9; Laboratory, Sec. 1 M W 2-5; Sec. 2 T Th 2-5. Assistant Professor WAHLGREN.

A study of the use, care, operation, adjustment, and repair of farm field machinery, such as tillage tools, seeders, harvesting equipment and sprayers, and the like. Horse drawn, as well as tractor equipment is included. The selection of the size and type of equipment best adapted for a specified size of farm is considered. Laboratory fee, \$3.

*†A 24. *PRINCIPLES OF CONCRETE CONSTRUCTION*...U,G; 2 hrs. July 6-July 16; Room 410, Stocking Hall. M thru F 8-11 and 1-4, Assistant Professor BOYD. Limited to 15 students. Course will be repeated July 25-August 5 if registration warrants.

Selection, testing, and proportioning of materials. Mixing, placing, finishing, curing and testing concrete. Simple design of footings, floor slabs and beams. Building forms and equipment; special processes, coloring, and masonry construction; inspection of local sand and gravel banks and concrete structures. Laboratory fee, \$5.

†A 42. *WELDING*...U,G; 1 hr. Two laboratory periods: Sec. 1 M W 9-11:30; Sec. 2 M W 2-4:30. One practice period to be arranged. Limited to 16 students a section. Mr. CLOUGH.

A course giving fundamentals and practice of oxy-acetylene welding and cutting of metals; spot welding and arc-welding with special emphasis on farm shop construction and repair. Laboratory fee, \$5.

†A 43. *ADVANCED WELDING AND METAL SHOP*...U,G; 1 hr. Three laboratory periods to be arranged. Permission of instructor required. Mr. CLOUGH.

This course provides the student with an opportunity to extend his knowledge and skills in welding operations and also acquaints him with the use and operation of essential machine shop tools such as drills, lathes, metal saws, and grinders as commonly found in vocational agriculture and farm shops. Laboratory fee, \$5.

A 251. *SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING*...G; 1 or more hrs. Permission of instructor. Professors FRENCH, JENNINGS, GOODMAN, ROBB, TERRY, and WRIGHT.

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*...G (U by permission); 2 hrs. No prerequisite, but a basic course in child psychology is desirable. Daily except Saturday 8. Nursery School observations, three hours a week, to be arranged with the instructor during registration. Professor WARING.

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 315. *CHILD DEVELOPMENT*...U,G; 2 hrs. Daily except Saturday 8. Professor DALTON.

Understanding the psychological growth and development of the child from birth through adolescence. Emphasis will be placed upon social and emotional development. The place of maturation in growth will be briefly considered. Fee, \$3.

†E 330. *PARTICIPATION IN NURSERY SCHOOL*...G; 2 hrs. Limited to 12 students. Prerequisite, permission of the instructor. T Th 2-4; laboratory hours to be arranged. Open to home economics teachers and other students with qualifications satisfactory to the instructor. Nine hours a week of supervised participation in the

Nursery School are required. Students must have two, three, or four hour blocks of available time between 8 and 1. Assistant Professor BARRETT.

Experience in the care and guidance of young children in a nursery school group supplemented by readings and discussion. Fee, \$3.

†E 333. *PROBLEMS IN ORGANIZATION AND ADMINISTRATION OF CHILDREN'S GROUPS*...G (U by permission); 2 hrs. Daily except Saturday 11. Associate Professor REEVES.

Programs and policies to be considered in setting up and operating the nursery school, child care center, play group and other preschool educational units. Minimum essentials in plant, staff, equipment, services. Professional resources and affiliations. Principles of program making for children from two to six years of age. Fee, \$3.

†E 351. *CHILDREN'S LITERATURE*...U,G; 2 hrs. Daily except Saturday 9. Associate Professor REEVES.

Literature as a resource in children's living. The relation of children's literature to world literature. Traditional and modern forms. Illustration in children's books. Reading interests of children two to twelve years of age. Fee, \$5.

†E 360. *DYNAMICS OF PERSONALITY*...U,G; 2 hrs. Daily except Saturday 10. Professor DALTON.

A study of the motivating forces in personality. Special attention will be given to some of the determinants of personality; the development of control and structure in the individual; unconscious processes as they influence normal behavior; and other directive forces in behavior. Fee, \$3.

†E 381. *TEACHING AS GROUP COUNSELING*...G (U by permission); 2 hrs. Daily except Saturday 9. Mr. FELDMAN.

The students' perception of the teacher and his role in a group will be discussed as a function of his family relationships. The contribution of group living to personality development will be studied not only through an examination of the various theories and research data but also through participation by the students. Fee, \$3.

E 407. *RESEARCH IN CHILD DEVELOPMENT AND FAMILY RELATIONSHIPS*...G; 1 to 6 hrs. Registration by permission of the instructors; hours by arrangement. Mrs. WARING and Mr. FELDMAN.

ECONOMICS OF THE HOUSEHOLD AND HOUSEHOLD MANAGEMENT

†E 120. *HOUSEHOLD PROCESSES*...G; 2 hrs. M T Th F 9-11. Miss PURCHASE.

Application of chemistry, physics, and body mechanics to processes involved in the daily, weekly, and seasonal care of the home. Methods of work and equipment suitable for a given process. Nature of materials, and characteristics of supplies used for protecting or cleaning them. Commercial services available. Information useful in the day-to-day choices of this nature in managing in a home. Fee, \$3.

†E 130. *ECONOMIC CONDITIONS IN RELATION TO THE WELFARE OF FAMILIES*...G; 2 hrs. Daily except Saturday 8. Assistant Professor AIKIN.

The relationship between the economic welfare of families and the total amount of goods and services produced. The effect of specialization, industrialization, and price on the amount produced. The importance of fluctuations in the general level of prices in one's personal financial affairs. Marketing and taxation policies of concern to families. Fee, \$1.

†E 310. *MANAGEMENT IN FAMILY LIVING*...G; 2 hrs. Discussion, group projects, and field trips, T Th 2-5. Miss CREW and Mrs. NOLAN.

A study at first hand of the ways in which different families manage to achieve their individual purposes with the resources available to them. Cooperation with family members in working out a solution to some of the management problems in

their homes. Simplification of work as one means of managing. Demonstrations, motion pictures, slides, photographs, and work centers set up in the laboratory. Opportunity for preparing illustrative material. One all-day tour, time to be arranged. Fee, \$6.

†E 320. *HOUSEHOLD EQUIPMENT AS IT RELATES TO HOME MANAGEMENT*...G; 2 hrs. Discussion, laboratory, and field trips, M F 2-4, W 2-5. Associate Professor WILLIAMSON and Mrs. NOLAN.

The management involved in selection, use, care, and repair of household equipment for home and school. Variation in design and quality in relation to the individual situation. Trips to homes where certain equipment is being used and to stores offering a variety of appliances. Discussions with homemakers, service men, and distributors. Fee, \$3.

†E 330. *MANAGEMENT IN RELATION TO PERSONAL FINANCES*...G; 2 hrs. Daily except Saturday 11. Assistant Professor AIKIN.

The management procedure applied to individual and family problems involving finances. The influence of economic conditions as well as personal circumstances on one's financial situation. Important considerations in deciding upon insurance, savings, and investment programs. Sources and costs of credit. Purposes served by estimates and records. Fee, \$1.

E 403. *SPECIAL PROBLEMS FOR GRADUATE STUDENTS*...Credit and hours to be arranged. Department STAFF.

For graduate students recommended by their chairmen and approved by the head of the department and the instructor in charge for independent, advanced work.

E 407. *THESIS AND RESEARCH*...Registration with permission of the instructor. Associate Professor WILLIAMSON, Assistant Professor AIKIN, and Miss CREW.

Note: During a five-year period, it is planned to offer E 130 and E 310 each year, and every second or third year a selection from the following courses: E 120, E 320, E 330, and EH 260 and EH 420 as described in the Announcement of the College of Home Economics for the academic year.

FOOD AND NUTRITION

†E 240. *ADVANCED FOOD PREPARATION*...U,G; 2 hrs. Prerequisite, a course in food preparation satisfactory to the instructor. Lecture, T Th 2; laboratory, M W F 2-4:20. Assistant Professor ERICSON.

Special dishes such as fancy yeast breads, entrees, meats, cheese, canapes, and hors d'oeuvres, salads, foreign foods, puff pastry, boned fowl, fish, and desserts for specific purposes and occasions. Study and preparation of some unusual foods and food products. Laboratory fee, \$12.

†E 250. *HOME PRESERVATION OF FOOD*...U,G; 2 hrs. Prerequisite, college courses in chemistry and food preparation. Lecture, T Th 8; laboratory, M W F 8-10:30. Miss BRENNAN.

Home food preservation methods including storing, canning, freezing (use of a food locker and freezer), pickling, and jelly and jam making; the principles and techniques involved in each method and a study of the problems presented by various home situations. Laboratory fee, \$12.

†E 260. *MANAGEMENT PROBLEMS IN MEAL PLANNING, PREPARATION, AND SERVICE*...U,G; 2 hrs. Prerequisites, courses in nutrition and food preparation satisfactory to the instructor. Discussion, M W F 11; laboratory, T Th 11-1. Associate Professor FOSTER.

Consideration is given to management problems commonly met in the planning, preparation, and service of family meals and of ways of solving these problems. Laboratory fee, \$8.

†E 320. *EXPERIMENTAL COOKERY*...G; 2 hrs. Prerequisite, previous courses in food preparation satisfactory to the instructor. Discussion and laboratory, T W Th F 1-4. Professor PERSONIUS.

Independent laboratory work in the solving of practical problems in food preparation. Study of methods and techniques used in experimental work. Judging of food products. Fee, \$12.

†E 328. *RECENT FINDINGS IN NUTRITION*...U,G; 2 hrs. Prerequisite, a college course in nutrition. The course is not open to students who have had advanced courses in nutrition within the past two years. Lecture and discussion, daily except Saturday 9. Professor HAUCK.

Planned for students who wish to bring their information about nutrition up-to-date. The topics studied will be those which are related to practical problems in human nutrition. Emphasis on energy metabolism and vitamins. Fee, \$1.

(Course E 329, with emphasis on proteins and minerals will be offered in alternate years).

†E 350. *PROBLEMS IN NUTRITION*...G; 2 hrs. Prerequisite, experience in teaching and permission of the instructor. Discussions, M W F 8; laboratory, T Th 8-10. Professor STEININGER.

Discussion of problems which arise in teaching nutrition to high school, college, or lay groups. Students will be given help in selecting subject matter and illustrative material, and in methods of presenting such material. Fee, \$1.

E 403. *SPECIAL PROBLEMS FOR GRADUATE STUDENTS*...G; credit and hours to be arranged. Registration by permission. Department STAFF.

For graduate students recommended by their chairmen and approved by the head of the department and the instructor in charge for independent, advanced work. Cost of materials determined by the problem.

†E 415. *RECENT RESEARCH IN NUTRITION*...G; 1 hr. Sponsored jointly with the School of Nutrition. Prerequisites, some college work in nutrition, organic chemistry, or biochemistry, and physiology. Lecture, M W F 11. Professor HAUCK in charge.

Lectures will be given by leading authorities on the campus. Fee, \$1.

For related courses, see NUTRITION.

HOME ECONOMICS EDUCATION

For all courses in Home Economics Education see EDUCATION.

HOUSING AND DESIGN

†E 302. *COLOR AND DESIGN*...U,G; 2 hrs. Daily except Saturday 11-1. Miss STRAIGHT.

A basic course in the study of design and color, with laboratory problems and experiments. Opportunity for special projects to satisfy individual needs. The course is planned to present practical applications of design and color, as well as enriching experiences for personal development. Fee \$10.

†E 303. *TECHNIQUES AND LAYOUTS FOR POSTERS, EXHIBITS, DEMONSTRATION DISPLAYS*...U,G; 2 hrs. Prerequisite E 302 or equivalent, or instructor's consent. T Th 2-4:30. Miss STRAIGHT.

A course in visual presentation techniques. Lecture demonstrations with outside reading required. Practice in planning exhibits, use of lettering, layouts, and color. Student may prepare material for own use, in which case there may be additional expense. Fee \$10.

†E 310. *STUDY OF ROOMS, SELECTION AND ARRANGEMENT OF FURNISHINGS*...U,G; 2 hrs. No prerequisite, but previous study of color and design desirable. Daily except Saturday, 9-11, or 2-4. Associate Professor WRIGHT.

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 \$10.

†E 316. *HOUSE PLANNING*...U,G; 2 hrs. M W F 8-11, or 2-5. Mr. and Mrs. WILLIAMS.

Introductory course in comprehensive home planning, incorporating house, landscape, and neighborhood. Drafting room work, lectures, local trips, outside reading. Elementary design problems in space arrangement and construction. Discussion of typical and new construction methods and prefabrication. Fee \$10.

†E 326. *THE HOUSE AND THE FAMILY*...U,G; 1 hr. M 2-4. Mr. GUTHEIM.

Family housing needs as influenced by the physical qualities of housing and its environment. An introduction to the basic problems of providing adequate housing for families of different sizes, types, and economic levels. Fee, \$5.

†E 403. *SPECIAL PROBLEMS FOR GRADUATE STUDENTS*. G. Credit and hours to be arranged. Department STAFF.

For graduate students recommended by their chairman and approved by the head of the department and the instructor in charge for independent, advanced work. Fee, \$5 a credit hour.

INSTITUTION MANAGEMENT

†E 230. *QUANTITY COOKERY*...U,G; 3 hrs. Prerequisite, elementary courses in nutrition and food preparation. Lecture, discussion, and laboratory M W F 8-1:30. Miss MOORE.

Quantity preparation of the major foods for the Home Economics Cafeteria where approximately 2000 persons are served each day; use and operation of institution cooking equipment; organization and scheduling of production; menu planning and recipe costing. The student is expected to apply basic principles and procedures of food preparation, food chemistry, and nutrition. White uniforms and hairnets are required. Fee, \$10.

†E 250. *SCHOOL LUNCH OPERATION*...U,G; 2 hrs. Prerequisite, elementary courses in food and nutrition. Lecture and discussion, T Th 10-12; laboratory, T Th 3-5. Twice during the six-weeks period students will be expected to prepare and serve a Cafeteria meal for 50 persons. Assistant Professor WOOD.

This course is planned for homemaking teachers who have not had courses in Institution Management, but who have or expect to have responsibility for the school lunch program. It will deal primarily with problems of school lunch operation including organization and management procedures, with emphasis on use of records, presentation of operational reports, development of work schedules, selection and care of food and equipment, and sanitation practices. Some practice in quantity food preparation and service will be included. Consideration will be given to the organization and evaluation of the school lunch program, its objectives and functions in terms of the community and the school. Fee, \$3.

†E 340. *SELECTION AND CARE OF FOOD SERVICE EQUIPMENT*...G; 2 hrs. Prerequisite, a course in quantity food preparation or equivalent experience. Lecture and discussion, daily except Saturday 11; laboratory, Th 3-4:30. Associate Professor BURGOIN.

A discussion of the bases of selection of major items of food service equipment, specifications; installation considerations; operation; causes of deterioration; care; maintenance materials and upkeep. Fee, \$1.

†E 360. *A STUDY OF PROCEDURES AND WORK PROCESSES IN FOOD SERVICE MANAGEMENT...*G; 2 hrs. Prerequisite, a course in food service organization and administration and/or managerial experience. Lecture and discussion daily except Saturday 9. Two one-hour observation periods to be scheduled each week. Assistant Professor RIPLEY.

A consideration of administrative functions and of organizational and operational procedures which make for efficiency in administration. Principles of work simplification will be applied to specific work processes in the institution kitchen. Fee, \$1.

E 300. *SPECIAL PROBLEMS...*G; 1 or 2 hrs. Credit and hours to be arranged individually. Registration by permission of Professor HARRIS.

Independent, advanced work on a problem not dealt with by other courses in the department. Cost of materials determined by the problem.

E 403. *SPECIAL PROBLEMS FOR GRADUATE STUDENTS...*G; credit and hours to be arranged. Registration by permission of Professor HARRIS.

For graduate students recommended by their chairman and approved by the department head and the instructor in charge for independent, advanced work. Cost of materials determined by the problem.

E 407. *THESIS AND RESEARCH...*G; credit and hours to be arranged. Registration by permission of Professor HARRIS.

For graduate students, majoring in the department, who are completing their theses. Cost of materials determined by the research being undertaken.

TEXTILES AND CLOTHING

† E 130. *TEXTILES: CLOTHING FABRICS...*U,G; 2 hrs. Daily except Saturday 8-10. Miss WHITE.

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. Estimated cost of materials, \$3. Fee, \$5.

†E 200. *FITTING AND PATTERN MAKING...*G, (U by permission); 2 hrs. Prerequisite, professional experience or course work in the area of clothing design and construction. Daily except Saturday 2-4. Associate Professor HILLHOUSE.

Laboratory problems include fitting a basic pattern; practice in pattern making; the making of two garments by flat pattern methods, carried through to completion.

Materials to be provided by the students at an estimated cost of \$15 to \$25. Fee, \$5.

E 320. *PROBLEMS IN BUYING CLOTHING...*U,G; 2 hrs. Daily except Saturday 10. Associate Professor BRASIE.

This course offers students further opportunity to study intensively the problems involved in acquiring and maintaining a satisfactory wardrobe; to acquire more skill in buying garments; to develop an understanding of the problems and processes involved in clothing merchandizing and consumer education in this field.

The group work is supplemented by reference reading, building a bibliography of sources of information, and the working through of special problems selected by the students to meet individual needs either from the consumer or merchandizing position. (If field trips are possible, students will be responsible for transportation and living expenses).

†E 340. *ADVANCED DRESSMAKING...*G, (U by permission); 2 hrs. Prerequisite, professional experience or course work in the area of clothing design and construction. Daily except Saturday 9-11. Associate Professor HILLHOUSE.

A course in advanced construction methods. Emphasis in this course will be given to finishing details and the handling of unusual fabrics and designs.

Materials to be provided by the students at an estimated cost of \$20 to \$40. Fee, \$10.

†E 350. *ADVANCED TEXTILES...G*, (U by permission); 2 hrs. Intended for teachers and others who have had previous work in textiles and who wish to review in this field. Daily except Saturday 11-1. Miss WHITE.

A course in advanced textiles which aims to help the student develop through individual experiment and guided observation a greater understanding of the physical properties of fiber, yarn, and fabric as they affect durability and the satisfaction to be obtained by the consumer. A study of the source, production, and microscopic identification of textile fibers. Standardized methods for testing and identification will be used wherever possible. An introduction to textile literature and to certain research techniques. Discussion of consumer demands with respect to specific textile products, and evaluation of available guides and aids to the consumer, such as existing legislation. Development of a special problem by the student to meet individual interests. Fee, \$5.

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 MECHANICS AND MATERIALS

1151. *MECHANICS—STATICS...U,G*; 3 hrs. Prerequisite, parallel registration in mathematics 163. Daily at 11 and Th 1-2:30.

The principles of statics and particle dynamics and their use in the solution of engineering problems of equilibrium and motion of machines and structures. Forces and couples in a plane and in space; friction; velocity and acceleration; particle motion under given forces.

1152. *MECHANICS—DYNAMICS...U,G*; 3 hrs. Prerequisite, course 1151. Daily at 12 and Th 2:30-4.

Dynamics of rigid bodies; motions of translation, rotation, and general motion, in two dimensions under given forces; impulse and momentum; work and energy. Stress and strain; tension, compression, and shear; analysis of riveted and welded joints; torsion of shafts; helical springs.

1153. *STRENGTH OF MATERIALS...U,G*; 3 hrs. Prerequisite, course 1111 or 1151 and 1152. Section 1, daily at 8 and W 1-2:30.

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.

1155. *APPLIED MATHEMATICS*...U,G; 3 hrs. Prerequisite, courses 1151 and 1152. Daily at 11 and M 1-2:30.

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.

1221. *ENGINEERING MATERIALS*...U,G; 3 hrs. Prerequisite, Chemistry 105, 106 or their equivalent. Daily at 9 and W 2:30-4.

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

1222. *ENGINEERING MATERIALS*...U,G; 3 hrs. Prerequisite, course 1221. Daily at 10 and W 1-2:30.

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.

1231. *ENGINEERING MATERIALS LABORATORY*...U,G; 3 hrs. Prerequisite, courses 1221 and parallel registration in 1153. Section 1, M and Th 1-4:30.

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.

1232. *ENGINEERING MATERIALS LABORATORY*...U,G; 3 hrs. Prerequisite, course 1222 or 1231. Section 1, M and Th 1-4:30.

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

2331. *FLUID MECHANICS*...U; 3 hrs. Prerequisite, 1136 and 1138, or equivalent. Daily M through S 8. Associate Professor BOGEMA.

Properties of fluid. Fluid pressure. Dynamics of fluids. Impulse and momentum. Pipe flow. Orifices, weirs, nozzles, gates. Open channel flow.

2502. *WATER SUPPLY AND TREATMENT*...U; 3 hrs. Prerequisite, 2351. Daily except Saturday 11; T Th 2-4:30. Associate Professor GIFFT.

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

2503. *SEWERAGE AND SEWAGE TREATMENT*...U; 3 hrs. Prerequisite, 2351. Daily except Saturday 10; M F 1:30-4:30. Associate Professor GIFFT.

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

2610. *HIGHWAY ENGINEERING*...U; 3 hrs. Prerequisite, 2601 and 2725. Daily except Saturday 10; M F 1:30-4:30. Associate Professor LEWIS.

Design of streets and highways, subgrades, stabilization, drainage, construction of pavements. Tests of highway material.

2612. *HIGHWAY LABORATORY*...U,G; 3 hrs. T W Th 1:30-4:30. Associate Professor LEWIS.

Tests of highway materials. Soil stabilization experimentation.

2702. *STRUCTURAL DESIGN*...U; 3 hrs. M through S 8-10:30. Associate Professor BURROWS.

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

2706. *STEEL BUILDINGS*...U,G; 3 hrs. M through S 10:30-1. Associate Professor BURROWS.

Design of the steel framework for buildings used in industry.

2707. *BRIDGE DESIGN*...U,G; 3 hrs. Prerequisite, 2702 or the equivalent. M through S 8-10:30. Associate Professor BURROWS.

Computations and drawings for the complete design of a railroad bridge of six or seven panels or a heavy highway bridge. The computations to determine the stresses and sections of all members, pins, pinplates, splices, deflection, camber, and other details, as well as of connecting rivets, are to be written up in the form of systematically arranged reports. The drawings consist of general detail plans showing the location of all rivets as well as the composition and relation of all members and connections. The final report is to give a full list of shapes and plates, and a classified analysis of weight for the span.

2708. *INVESTIGATION OF EXISTING BRIDGES*...U,G; 3 hrs. Prerequisite, 2702 or the equivalent. M through S 8-10:30. Associate Professor BURROWS.

Inspection of existing structures for the determination of sizes and conditions of plates and shapes. After full data have been obtained in the field, computations will be made to determine either the unit stresses under a specified load, or the safe load or rating according to standard specifications.

2715. *REINFORCED CONCRETE DESIGN*...U,G; 3 hrs. Daily except Saturday 1:30-4:30. Associate Professor MAINS.

2720. *FOUNDATIONS*...U; 3 hrs. Daily except Saturday 3-4. Associate Professor MAINS.

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

2752. *ENGINEERING PROBLEMS*...U; 2 hrs. Prerequisite, 1138, 2302, or 2351. M W F 1:30-4:30. STAFF.

Problems in ordinary engineering practice.

2902. *ENGINEERING LAW*...U; 3 hrs. M through S 8. Professor THATCHER.

An introductory course in the laws of contract, tort, agency, real property, water rights, form of business organization, sales, and negotiable instruments; special subjects such as workmen's compensation, mechanics' liens, arbitration, and patent law are also included.

2903. *ECONOMICS OF ENGINEERING*...U; 3 hrs. Prerequisite, Construction Methods, Economics 107, and Accounting. M through S 9. Professor THATCHER.

The economic aspects of engineering and the application of principles of management to the work of the engineer; economic selection of materials, equipment, and structures; studies for the replacement of existing units; plant layouts; public works economy; the technique of estimating quantities and costs for various types of engineering projects.

ADMINISTRATIVE ENGINEERING

3231. *PRINCIPLES OF INDUSTRIAL ACCOUNTING*...U,G; 3 hrs. Recitations daily except Saturday 9 or 10. Computing periods, M Th or T F 2-4:30. Assistant Professor SAUNDERS and Mr. ALLEN.

A basic course in modern industrial accounting and in cost finding covering the theory of debits and credits, development of the books of original entry, controlling accounts, voucher system, analysis of financial statements, and elements of cost finding.

3235. *INDUSTRIAL ORGANIZATION AND MANAGEMENT*...U,G; 3 hrs. Recitations daily except Saturday 9 or 10 and W 1-2:30 or 2:30-4:00. Assistant Professor SAMPSON.

An introductory course in the field of industrial management. The course starts with the industrial revolution and deals briefly with the principles of mass production, types of business enterprises, and the location and growth of industry. Then, in somewhat more detail are discussed the organization of the plant facilities and the plant personnel with special emphasis on the layout of the plant, types of organizational control, personnel function, motion and time study, and wage payment systems.

3261. *INDUSTRIAL ENGINEERING*...U,G; 3 hrs. Prerequisite, courses in industrial organization and management and principles of industrial accounting. Recitations, M Th 9-10:30 and Laboratory, T W F S 8-10:30. Professor MILLARD.

A study of fundamental problems in industrial management including consideration of the principles of economy involved. Study is built around a series of practical problems involving the principles and practices of: industrial organization; location and design of industrial plants; equipment selection; departmental and machine layouts; materials handling and warehousing equipment and methods; plant maintenance; time and motion study; purchasing; production control; quality control; economic lot sizes; and wage payment plans.

MACHINE DESIGN

3337. *DESIGN OF MACHINE MEMBERS*...U,G; 3 hrs. Prerequisites, Courses 1112 or 1153, 1221, 3351 or 3327, 3402 or 3403. Course 3337 may *not* be substituted for course 3353. Lecture-recitations, daily except Saturday at 11. Computation period M and Th 2-4:30. Professor BURR.

Application of mechanics, kinematics, materials, and processes to the design and selection of machine members such as fastenings, links, springs, translation screws, belts, wire-rope, chains, couplings, clutches, brakes, gears, shafts, and bearings.

3351. *MECHANISM*...U,G; 3 hrs. Prerequisites, courses 3112 and 1151. Recitations daily except Saturdays at 8 and computation period, T and F 2-4:30. Associate Professor HINKLE.

A study of displacements and forms of mechanism, linkages, cams, gears, belts, and trains of mechanism.

3352. *DYNAMICS OF MACHINERY*...U,G; 3 hrs. Prerequisites, courses 3351 and 1152 (for four-year students simultaneous registration in course 1152 is acceptable). Recitations daily except Saturday at 9 and laboratory T and F 2-4:30. Associate Professor HINKLE.

Graphical and analytical studies of velocities and accelerations and of static and inertia forces in mechanism; engine force analysis, flywheels, and balancing.

MATERIALS PROCESSING

3407. *ADVANCED MATERIALS PROCESSING*...U,G; 3 hrs. Prerequisite, course 3403 (shop course) or the equivalent; desirable courses 6110 (Metallurgy) or 1221 (Engineering Materials) and 3351 (Kinematics) or the equivalent. Lectures, M W F 8. Laboratory periods, T Th 8-10:30. Associate Professor HENDRICKSEN.

An advanced course in the engineering aspects of machine tools, cutting tools, and workshop production methods. The action of the cutting tool. Mechanics of chip formation and the built-up edge. Work hardening. Chip pressure, tool wear and tool life. Cutting fluids. Machinability. Principal features of cutting tools.

Classification of machine tools. Feeds, speeds, and capacities. Mechanical, hydraulic and electrical drives for machine tools, performance, efficiency, and fields of application. Prevention of vibration and chatter. Principal elements of machine tools. Machine tool manufacturing and testing methods. Present trend in development. Obsolescence and modernization. Care and maintenance.

3536. *HEAT-POWER ENGINEERING*...U,G; 3 hrs. Prerequisite, one term of heat-power engineering (course 3535). Recitations, daily at 10 and W 2:30-4. Associate Professor GAY.

3581. *INTERNAL COMBUSTION ENGINES*...U,G; 3 hrs. Prerequisite, course 3535 or its equivalent. Section 1, daily at 11 and W 1-2:30. Section 2, daily at 12 and W 2:30-4. Associate Professor WATSON.

Fundamentals of internal combustion engines with emphasis on thermodynamics and the combustion process.

3588. *REFRIGERATION AND AIR CONDITIONING*...U,G; 3 hrs. Prerequisites, two terms of heat-power engineering (courses 3535, 3536). Recitations, daily except Saturday 12; two laboratory periods, M Th 2-4:30 or T F 2-4:30. Assistant Professor TRACY.

Principles of refrigeration; refrigeration apparatus; principles and practice in the conditioning of air.

3631. *MECHANICAL LABORATORY*...U,G; 3 hrs. Prerequisites, two terms of heat-power engineering (courses 3535, 3536). Two laboratory periods, M Th 1-4:30 or T F 1-4:30. Associate Professor ERDMAN.

Laboratory instruction on steam power plants and power plant auxiliaries, internal combustion engines, hydraulic and pneumatic machinery (an abbreviated form of course 3630).

3640. *INTRODUCTORY MECHANICAL LABORATORY*...U,G; 3 hrs. Prerequisites, two terms of heat-power engineering (courses 3535, 3536). Two laboratory periods, M Th 1-4:30, or T F 1-4:30. Associate Professor DROPKIN.

Pressure measurement and control; steam calorimetry; indicators and planimeters; flow measurement; exhaust gas analysis; dynamometers (an abbreviated form of course 3620).

ELECTRICAL ENGINEERING

4111. *BASIC ELECTRICAL ENGINEERING*...U; 4 hrs. Prerequisites, Mathematics 163 and Physics 117. Lecture, T Th 9; recitation, daily except Saturday 11; computing, T Th 1:40-4:30. Assistant Professor DAVIES.

Text: Strong, *Basic Electrical Engineering*. 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 non-uniform 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 with capacitance.

4112. *ALTERNATING CURRENT CIRCUIT*...U; 4 hrs. Prerequisite, 4111 or equivalent. Lecture, M W 9; recitation, daily except Saturday 8; computing, M W 1:40-4:30. Assistant Professor KELLY and staff.

Text: Kerchner and Corcoran, *Alternating-Current Circuits*. A study of average effective values, vectors, vector algebra series, parallel and series parallel circuits; loci network theorems, coupled circuits, 3-phase power, nonsine waves.

4116. *ELECTRICAL CIRCUIT LABORATORY*...U; 3 hrs. Prerequisite 4111. Must be preceded or accompanied by 4112. Recitation, M F 10; laboratory, Section 1 M Th 1:40-4:30, Section 2 T F 1:40-4:30, Section 3 W 1:40-4:30 and S 8-11. Professor BURCKMYER and staff.

Text: Laws, *Electrical Measurement*, and mimeographed notes. A laboratory course normally following course 4111, and intended to stress the laboratory principles and practice of topics related to this material.

4121. *ELECTRON TUBES AND CIRCUITS*...U; 3 hrs. Prerequisite 4112. Must

be accompanied by course 4126. Recitation, daily except Saturday 9, computing F 1:40-4:30 and S 8-11. Mr. ANKRUM and staff.

Text: Ryder, *Electronic Engineering Principles*. This is the first of a group of courses which present and expand the fundamental laws of electronic behavior and correlate such behavior with the functioning of simple electronic circuits. The material covered in this first course includes: the theory of matter and of electron emission; emitters; conduction in high vacuum and in gas; diode characteristics; photoelectric cells; the construction, characteristics, and control of the cathode-ray tube; rectification and filtering with L and π filters; high-vacuum triode characteristics, tube parameters, and equivalent-circuit studies; multi-grid tube characteristics; and R-C coupled amplifier characteristics.

4126. *ELECTRONICS LABORATORY*...U; 2 hrs. Prerequisite 4112. Must be accompanied by course 4121. Laboratory, Section 1 M W 1:40-4:30, Section 2 T Th 1:40-4:30. Mr. ANKRUM and staff.

This course is a laboratory study of topics selected from the accompanying theory course. The characteristics of typical electron tubes are determined, and these tubes are then utilized in appropriate circuits for more complete tests and analyses.

4211. *DIRECT CURRENT MACHINERY*...U; 3 hrs. Prerequisite 4111 or equivalent. Recitation, daily except Saturday 12, computing, M Th 1:40-4:30. Professor TARBOUTX and staff.

Text: Kloeffer, Brenneman and Kerchner, *Direct-Current Machinery*. A study is made of the construction, operating characteristics, applications, and control of direct-current generators, motors and motor-generator sets. Among the topics studied are: generator and motor parts and construction; armature windings; operating characteristics; armature reaction; commutation, and brush setting; losses and efficiency; rating; parallel operation of generators; motor applications; manual and automatic motor controllers; special generators such as boosters, welders, Amplidyne, Rototrol, aircraft, and marine types, and dynamotors; generators and motors for bus, train, and marine service; storage battery charging equipment and circuits.

4216. *ELECTRICAL MACHINERY LABORATORY*...U; 4 hrs. Prerequisites 4116 and 4211. Must be preceded or accompanied by 4221. Recitation, M F 11; laboratory, Section 1 M Th 1:40-4:30, Section 2 T F 1:40-4:30, Section 3 W 1:40-4:30 and S 8-11. Professor BURCKMYER and staff.

Text: Mimeographed notes. Following a study of direct-current magnetization in general and the magnetic circuits of dynamos, the course proceeds to measured and predicted characteristics of direct-current generators and motors with all common methods of excitation; characteristics of generators in parallel; detection and correction of faulty commutation; construction, connection, and operating characteristics of typical direct-current motor-controllers; measurement of segregated losses, and prediction of efficiency of dynamos by mechanical-drive and by retardation methods; characteristics and typical applications of the Amplidyne. There is also a continuation of the study of elementary single-phase a-c circuits, and a study of a-c bridge circuits and the detectors commonly used in such circuits.

4221. *ALTERNATING-CURRENT MACHINERY*...U; 3 hrs. Prerequisite 4112. Recitation, daily except Saturday 10; computing, T F 1:40-4:30. Professor TARBOUTX and staff.

Text: Bryant and Johnson, *Principles of Alternating Current Machinery*. A study is made of the construction, operating characteristics, applications, and control of transformers, synchronous machines, and single-phase and poly-phase induction motors.

4931. *ELECTRICAL ENGINEERING*...U; 3 hrs. Prerequisites, Mathematics 163, Physics 117, and Mechanics 1152. Recitation daily except Saturday 8; computing W F 1:40-4:30. Associate Professor ERICKSON and staff.

Text: Dawes, *Electrical Engineering*, Vols. I and II. The course consists of an elementary study of direct-current electric circuits; the concepts of resistance, inductance, and capacitance; magnetic circuits; single-phase and three-phase alternating current circuits; and instruments and techniques appropriate for making measurements in all such circuits.

4932. *ELECTRICAL ENGINEERING*...U; 3 hrs. Prerequisite 4931. Recitation daily except Saturday 9; Laboratory. Section 1 M W 10:30-1, Section 2 T Th 1:40-4:30, Section 3 M 1:40-4:30 and S 10:30-1. Associate Professor ERICKSON and staff.

Text: Dawes, *Electrical Engineering*, Vols. I and II. The course is intended to develop a general understanding of d-c generators and motors, motor starters and controllers, transformers, induction motors, synchronous machines, a-c and single-phase motors, and d-c and a-c selsyn units. All machines are considered as to construction, theory of operation, and operating characteristics.

EDUCATION

ADMINISTRATION, SECONDARY EDUCATION AND CURRICULUM

S 33. *METHODS AND MATERIALS IN THE TEACHING OF ENGLISH*...G; 2 hrs. Daily except Saturday 8. Mrs. OCVIRK.

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. *SPECIAL PROBLEMS IN TEACHING THE SOCIAL STUDIES IN SECONDARY SCHOOLS*...G; 2 hrs. Daily except Saturday 8. Miss KLEE.

This course is designed to meet the needs of two groups of graduate students, (1) those who wish to satisfy teacher certification requirements, and (2) teachers of experience who wish the opportunity to carry on projects of individual interest in the fields of instruction, curriculum re-evaluation, or evaluation in the social studies. Miss Mildred McChesney, Supervisor of Social Studies in the New York State Education Department, will spend one week with this class. Prospective members of the class are invited to correspond with the instructor concerning details of the course and suggestions for individual study projects.

S 224. *METHODS AND MATERIALS OF INSTRUCTION IN THE ELEMENTARY SCHOOL*...G; 2 hrs. Daily except Saturday 10. Miss KLEE.

This course is planned to give students first-hand experiences in one of the newer methods of instruction of the elementary school; *cooperative pupil-teacher planning*. Problems to be attacked and methods of solving them will be determined by the needs and interests of the members of the class. Each student will carry on, either individually or with others, a comprehensive study of one phase of elementary school instruction. Prospective members of the class are invited to correspond with the instructor concerning the scope and methods of this course.

A 243. *PROCEDURES AND TECHNIQUES IN SUPERVISION*...G; 2 hrs. 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-teacher 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 261. *FUNDAMENTALS OF EDUCATIONAL ORGANIZATION AND ADMINISTRATION*...G; 2 hrs. Daily except Saturday 10. Professor BUTTERWORTH.

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

A 262. *THE SECONDARY SCHOOL PRINCIPALSHIP*...G; 2 hrs. Daily except Saturday 8. Assistant Professor ELLIOTT.

A course in school administration dealing with the responsibilities of the secondary school principal within the school building. An opportunity will be afforded to make an analysis of procedure and techniques employed by a secondary school principal.

A 264. *FINANCIAL POLICIES AND PRACTICES IN THE PUBLIC SCHOOL*...G; 2 hrs. M W Th 1-2:30. Professor BALDWIN.

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 265. *THE SCHOOL PLANT*...G; 2 hrs. Daily except Saturday, 11-12:30. Professor BALDWIN.

A workshop planned for administrative officers who expect to face building problems within the next few years. 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; and measuring probable utilization. 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 School of Education for a statement of the types of data desired.

A 276. *CURRICULUM WORKSHOP*...G; 2-4 hrs. M W F 1-5. "Integration through the special subject matter fields." Prerequisite, teaching experience or equivalent.

General Coordinator, Assistant Professor ELLIOTT.

Agriculture, Associate Professor HOSKINS.

Industrial and Technical, Assistant Professor BROPHY.

Home Economics, Assistant Professor BLACKWELL.

Administrative and Supervisory Personnel, Assistant Professor ELLIOTT.

In addition to these staff members, consultants will be available in the special fields of English, Social Studies, Mathematics, and Science.

Students will be expected to devote one-half of the time of the course to general problems of curriculum construction and one-half time to problems in their special subject matter areas. Two of the four hours credit may be taken in the curriculum problems of the subject matter area if the student so desires.

The workshop will provide an opportunity for experienced teachers, administrators, and supervisors from high schools, technical institutions, and junior colleges to work on curriculum problems and related projects under the direct supervision of members of the staff. General meetings of the entire group will be interspersed with special group conferences of students with similar interests.

Since the number of students who can be accommodated will be limited, interested teachers, supervisors, and administrators should make application to Professor A. L. Winsor, Director of the School of Education, stating the field in which they are interested and the nature of the problem upon which they wish to work. Such advance information will be most helpful to the participants.

A 298. *SEMINAR IN RURAL EDUCATIONAL LEADERSHIP*...G; 2 hrs. Daily except Saturday 9. Professor BUTTERWORTH.

A consideration of the problems of leadership especially significant in rural areas.

Planned for superintendents, principals, extension workers, and others preparing for leadership responsibilities in rural education.

AGRICULTURAL EDUCATION

A 133. *PROBLEMS IN TEACHING VOCATIONAL AGRICULTURE*...U,G; 3 hrs. M T W 10; laboratory, M T 1:30-4. Professor OLNEY.

New developments in selected fields of technical agriculture, emphasizing recent subject matter materials in each field with special reference to availability, selection and development of teaching activities and materials for use with high school classes. Credits may count toward certification requirements in New York State.

A 230. *SEMINAR IN AGRICULTURAL EDUCATION RESEARCH*...G; 2 hrs. Daily except Saturday 8. Professor OLNEY.

Study of current literature and studies in agricultural education, reports on findings. Evaluation of techniques in the selection and development of problems with application to present and needed studies.

A 237. *AGRICULTURAL CURRICULUM AND COURSES OF STUDY*...Group meetings, conferences and special problems during assigned hours for course A 276. G; 2 hrs. Associate Professor HOSKINS.

Evaluation and experience in building courses of study in vocational education in agriculture as related to the agricultural curriculum in the secondary school.

A 293. *ADULT EDUCATION FOR RURAL AREAS*...G; 2 hrs. Daily except Saturday 11. Associate Professor HOSKINS.

Designed for special teachers and leaders desiring to work toward the development of more comprehensive programs of special and adult education in rural areas. Consideration will be given to determining area needs, planning special and comprehensive programs, and the selection or training of leadership.

APTITUDE AND ACHIEVEMENT TESTS

A 251. *EDUCATIONAL MEASUREMENT*...G; 2 hrs. Daily except Saturday 8. Associate Professor BAYNE.

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

A 255. *USE AND INTERPRETATION OF TESTS IN GUIDANCE*...G; 2 hrs. 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 607. *MENTAL MEASUREMENTS*...U,G; 2 or 3 hrs. 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 ABELSON.

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

EDUCATIONAL PSYCHOLOGY

A 111. *EDUCATIONAL PSYCHOLOGY*...U; 2 hrs. Not open to freshmen. Daily except Saturday 9.

Designed for prospective teachers. Consideration of essential facts and principles of psychology and their practical application to problems in education.

A 215. *PSYCHOLOGY OF ADOLESCENCE*...U,G; 2 hrs. Daily except Saturday 10. Associate Professor BAYNE.

A study of behavior during adolescence; tasks involved in developing maturity; effect of preceding stages of development on maturity and adolescence.

A 313. *PSYCHOLOGY OF READING*...G; 2 hrs. Daily except Saturday 11.

Designed for experienced teachers, supervisors, guidance workers, and administrators. The basis for improvement of reading instruction. Appraisal of teaching practices and instructional materials; group testing programs and individual diagnostic procedures; remedial and corrective reading techniques.

S 612. *PSYCHOLOGY OF EXCEPTIONAL CHILDREN*...G (U by Permission); 2 hrs. Daily except Saturday 11. Professor ABELSON.

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.

GUIDANCE AND PERSONNEL

S 280. *STUDENT PERSONNEL ADMINISTRATION IN COLLEGES AND UNIVERSITIES*...G; 2 hrs. Daily except Saturday 11. Dean ALLEN and Miss PEARD.

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*...G; 2 hrs. Daily except Saturday 9. Associate Professor NELSON.

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 283. *COUNSELING METHODS*...G; 4 hrs. Daily except Saturday 9-11. Pre-requisite, course 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*...G; 2 hrs. Daily except Saturday 10. Associate 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*...G; 4 hrs. Daily except Saturday 11, plus field trips as arranged. Mr. BOYLAN.

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

NATURE STUDY AND SCIENCE EDUCATION

A 107. *THE TEACHING OF NATURE STUDY AND ELEMENTARY SCHOOL SCIENCE*...U,G; 2 hrs. Lectures, M W F 11; laboratory or field work, T Th 2-4:30. Assistant Professor GORDON.

The content and method of nature study and elementary school science with emphasis on the biological aspects.

A 108. *FIELD NATURAL HISTORY*...U,G; 2 hrs. Lectures, M W 2-2:50. Field trips, M W 2:50-5:20, F 2-4:30. Miss ROSS.

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 202. *NATURE LITERATURE*...U,G; 2 hrs. Daily except Saturday 9. Assistant Professor GORDON.

A survey of nature and science prose, poetry, and fiction, with some attention to their significance at elementary and secondary school levels.

†A 208. *METHODS AND MATERIALS FOR THE TEACHING OF EARTH SCIENCE*...U,G; 2 to 4 hrs. Lectures daily except Saturday 10; laboratory or field work W F 2-5; additional field work during three week-ends to be arranged for those taking the course for 4 hours credit. 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, and the phases of general science which deal with astronomy, geology, and meteorology.

The optional week-end field work is designed to acquaint teachers with the geology of New York State. Places to be studied include the Adirondacks, the Helderbergs, the Catskills, the Hudson Valley, and Niagara Falls and Gorge. There will be many opportunities to make collections of rocks, minerals, and fossils, and to obtain photographs of geological features. Fee for this portion of the course, \$15.

GENERAL

B 199. *INFORMAL STUDY IN EDUCATION*...U; 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.

A 244. *PHILOSOPHY OF EDUCATION*...G; 2 hrs. Daily except Saturday 11. Professor MOORE.

A critical consideration of educational philosophies which are generally recognized as significant influences upon education as an essential in American life.

RESEARCH

B 300. *RESEARCH*...G; 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.

HOME ECONOMICS EDUCATION

E 403. *SPECIAL PROBLEMS FOR GRADUATE STUDENTS*...Credit and hours to be arranged. Department STAFF.

This course provides opportunity for students to do independent, advanced work, with permission of the instructor with whom problem is to be done. Plan B Master's

candidates who are working on studies may register for this course with approval of their chairmen.

E 407. *THESIS AND RESEARCH*...Credit and hours to be arranged. Department STAFF. Candidates for Plan A Master's degrees, Ph.D. degrees, and Ed.D. degrees, who are working on theses may register for this course with permission of their chairmen and the instructor.

†E 434. *TRENDS IN HOME ECONOMICS EDUCATION*...G; 2 hrs. Daily except Saturday 10. Associate Professor HOFER.

Consideration is given to recent trends in home economics education as it adjusts to meet the needs of the family in its present-day social, economic, and cultural environment. Fee, \$3.

†E 437. *TEACHING HOMEMAKING TO ADULTS*...G; 2 hrs. Daily except Saturday 9. Associate Professor PATTERSON.

This course is designed for administrators, supervisors, extension agents, teachers, social workers or others working in adult education programs.

Attention is focused on educational needs of adults, program planning, learning experiences, leadership, philosophy, promotion, and evaluation in adult education. Consideration is also given to the contributions that different agencies can make to an adult education program in the local community. Fee, \$3.

†E 446. *TEACHING AIDS IN HOMEMAKING EDUCATION*...G; 2 hrs. Daily except Saturday 8. Associate Professor HOFER.

This course is designed to help teachers, extension workers, and others use, prepare, and evaluate various types of teaching aids useful in homemaking education. Consideration will be given to the use of exhibits, films, slides, recordings, demonstrations, etc. in teaching. Fee, \$3.

†E 449. *CURRICULUM PLANNING IN HOME ECONOMICS*...G; 2 hrs. Group meetings, conferences and special problems during hours assigned for course A 276. (See page 51). Course A 276 (2 hrs.) is required for all students as a parallel course.

Students will be given opportunities to evaluate homemaking curricula and to develop curriculum materials for their own use. Fee, \$3.

†E 479. *RESEARCH IN HOME ECONOMICS EDUCATION*...G; 2 hrs. Daily except Saturday 10. Assistant Professor BLACKWELL.

This course is designed to acquaint teachers, extension agents, and other educational leaders with the contributions that educational research may make toward improving the effectiveness of teaching. Students will have an opportunity to plan and carry out a research problem of limited scope or to assist with a project already in progress, and to write a research report. Fee, \$3.

†E 481. *SUPERVISION IN HOME ECONOMICS EDUCATION*...G; 2 hrs. Daily except Saturday 11. Assistant Professor MOSER.

This course is planned for supervising teachers, supervisors, and other educational leaders who are engaged in supervision and for those teachers who are preparing for supervisory positions. Opportunity will be provided for students to work on individual problems. Fee, \$3.

HOME ECONOMICS EDUCATION WORKSHOP

Workshop for City Supervisors, July 13-27. Room 114. Miss MALLORY and Professor HUTCHINS.

This is a two-week workshop for state and city supervisors who wish to work together on administrative and curriculum problems and who have individual projects concerning which guidance is sought. It is sponsored jointly by the United States Office of Education and Cornell University. Registration fee, \$10.

THE CURRICULUM

The workshop will not carry college credit; therefore there will be no tuition fee for it. However, public lectures, discussions, and other events which are part of the regular Summer Session program will be open to participants of this group.

For further information concerning this workshop write to:

Professor Margaret Hutchins
College of Home Economics
Cornell University
Ithaca, N. Y.

INDUSTRIAL EDUCATION

I 83. *CURRICULUM CONSTRUCTION IN INDUSTRIAL EDUCATION...* U,G; 2 hrs. Lectures, M W F 1-3. Assistant Professor BROPHY.

A study of principles and procedures of curriculum and course of study developments in curriculum problems of trade and industrial, home economics, agricultural, and general education. The course will include discussion of technological and social changes and their impact on curriculum; principles of curriculum construction based upon analysis; controls which influence curriculum; evaluation of curriculums.

Note: Some joint sessions will be conducted with Education A276 to emphasize inter-relationships in curriculum problems of trade and industrial, home economics, agricultural, and general education. Separate sessions will be devoted to intensive study of special curriculum problems in industrial and technical education.

I 84. *APPRAISAL, USE, AND DEVELOPMENT OF INSTRUCTIONAL MATERIALS...* U,G; 2 hrs. Lectures daily except Saturday 9. Mr. RODEN.

A study of the various types of instructional materials such as textbooks, information and job sheets, and audio-visual aids; the conditions under which the various types are effective; methods of use; sources and costs; and the processes involved in developing instructional materials for specific purposes.

I 89A. *WORKSHOP—DEVELOPMENT OF INSTRUCTIONAL MATERIALS* ...U,G; 6 hrs. Daily except Saturday 9-4. Mr. RANNEY.

A workshop designed to provide opportunity, through consultant service and laboratory facilities, for students to prepare and revise instructional materials for courses in industrial and technical education. Students will be expected to have done preliminary work on their instructional materials, and to bring with them such data as will be useful. Permission of the instructor is required.

*I 89B. *WORKSHOP—POST-HIGH SCHOOL TERMINAL TECHNICAL EDUCATION...* U,G; 2 hrs. Daily except Saturday 9-4. Room 27, I. L. R. Building. August 1 to 13. Mr. ALMSTEAD and consultants.

A two-weeks comprehensive course giving attention to the problems of curriculum construction in post-high school terminal technical education programs. Part of each morning session will be given over to group discussion of principles and techniques of curriculum construction and their application to this program. The remainder of the day will be devoted to intensive individual work on development of specific curriculums and courses of study with opportunity for group discussion of specific projects. Students are requested to correspond with the instructor before registration.

I 130. *SUPERVISION OF INDUSTRIAL EDUCATION...* G; 2 hrs. Lectures daily except Saturday 9. Professor BEACH.

Objectives and fundamental principles of supervision; the planning and organization of a supervisory program; relationships of the supervisor to administrators and teachers; techniques and methods of supervision; the supervisor's responsibility for appraising the adequacy of equipment, materials, and supplies; measurement and evaluation of student and teacher achievement.

I 131. *SEMINAR — CURRENT PROBLEMS IN INDUSTRIAL EDUCATION...* G; 2 hrs. Daily except Saturday 10. Mr. HAWKINS.

A graduate seminar dealing with problems of special importance in the field of industrial and technical education at the present time. Discussion will include such problems as technical institute education, work-experience training for youth, integration of industrial and general education, training for semi-skilled occupations, area schools, and current legislation affecting industrial education.

I 132. *ADMINISTRATION OF INDUSTRIAL EDUCATION...* G; 2 hrs. Daily except Saturday 8. Mr. HAWKINS.

A study of administrative practices in industrial and technical schools. Discussion will include such aspects as the relationship of the industrial school administrator to other school officers; advisory committees and their functions; public relations; plant and equipment; budgetary procedures; staff personnel relations; teacher selection; student personnel procedures; and evening school organization and administration.

I 134. *RESEARCH PRACTICES IN INDUSTRIAL EDUCATION...* G; 2 hrs. Daily except Saturday 8. Mr. KETCHAM.

A study of researches in the field of industrial education including industrial arts, vocational, industrial, and technical education, the techniques of research applicable to these fields; implications in existing research for industrial education; trends in research, particularly as they apply to youth and adults not now being served by industrial education programs.

I 135. *INDUSTRIAL EDUCATION IN SMALLER COMMUNITIES...* G; 2 hrs. Daily except Saturday 11. Professor BEACH.

The organization and conduct of industrial education programs serving smaller high schools or consolidated school districts. Emphasis will be placed upon diversified part-time cooperative programs, apprentice training classes and vocational schools, county unit programs, and intermediate school districts.

I 136. *SEMINAR IN INDUSTRIAL ARTS EDUCATION...* G; 2 hrs. Daily except Saturday 10. Mr. KETCHAM.

Intended for graduate students with experience in industrial arts education. A study of current problems affecting industrial arts education.

EXTENSION EDUCATION

From July 11 to 30, inclusive, six 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 psychology, 4-H club organization, household economics, farm management, extension information service, evaluation, 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 \$40. 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. Courses daily except Saturday, July 23 and 30. A student may register in two courses only. Each course gives 1½ hours credit.

8 A.M.

*1. *EXTENSION EVALUATION...* G; 1½ hrs. Professor WILSON. Warren Hall, Room 140.

This course is designed primarily for experienced extension workers who are informed regarding extension history, philosophy, and objectives. Its purpose is to develop a broad concept of extension program development and teaching, through analysis and interpretation of techniques and procedures employed in extension planning, teaching, and measurement. It is not the intention of the course to make a "studies expert" of each student, but it covers techniques that any extension worker might use in appraising his own work—clarification of objectives, sampling procedures, analysis, interpretation, presentation, and use of data.

**2. 4-H CLUB ORGANIZATION AND PROCEDURES...*G; 1½ hrs. Mr. AITON, Warren Hall, Room 240.

Specially designed for county 4-H Club agents and other Extension youth workers, this course stresses 4-H Club objectives and the principles and operational aspects of planning and conducting effective youth programs. It includes lectures, demonstrations, and symposiums.

9:30 A.M.

**3. PSYCHOLOGY FOR EXTENSION WORKERS...*G; 1½ hrs. Professor KRUSE, Warren Hall, Room 140.

A point of view in education and in psychology for extension workers. The nature of man, with emphasis on the tendencies basic to effective influencing of human behavior. How people become changed as to their behavior. This phase treats the nature of learning, basic principles of learning, major types of learning, and conditions favorable for learning.

**4. EXTENSION INFORMATION...*G; 1½ hrs. Professor LONGSDORF, Warren Hall, Room 240.

A course designed to assist county and state extension workers to use with maximum efficiency newspapers, radio, publications, circular letters, exhibits, posters, and visual aids. Throughout, suggestions will be offered on subject matter presentation. The workshop plan will be followed, giving students opportunity to take part in discussions, news writing, radio presentations, letter writing, picture taking, and in planning for a practical program of information that can be used upon their return to posts of duty. The course will emphasize the practical application of journalism to every-day extension work. It is a course planned "to learn by doing".

11 A.M.

**5. PRINCIPLES OF FARM MANAGEMENT...*G; 1½ hrs. 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 present conditions. Trips will be made to visit farms in nearby regions.

**6. ECONOMIC CONDITIONS AND MANAGEMENT PROBLEMS OF FAMILIES...*G; 1½ hrs. Professor CANON, Martha Van Rensselaer Hall, Amphitheatre.

A course to help extension workers understand some of the important economic factors which concern families, and to adapt Outlook reports and other current economic information to their work with families. Discussion of teaching problems and teaching materials.

NATURAL SCIENCES

BACTERIOLOGY

†A 1. *GENERAL BACTERIOLOGY*...U,G; 2 or 4 hrs. Lectures, daily except Saturday 1:40; laboratory, daily except Saturday 2:30-4:30. Professor STARK and Mr. LANE.

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 IN BACTERIOLOGY*...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*...U; 3 hrs. Equivalent to Botany 1, first term. Lectures, daily except Saturday 2; laboratory and conferences, daily except Saturday 3-4:30. Professor PETRY and assistant.

The structure 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*...U; 3 hrs. 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. Assistant Professor UHL.

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 15A. *AQUATIC PLANTS—ALGAE*...U,G; 2 hrs. Prerequisite, Course 1 or its equivalent. May be taken in conjunction with 15B or independently. The lectures will cover both courses. Lectures daily except Saturday 8; laboratory and field work, MW 2-5:30. Two all day trips. Professor MUENSCHER.

A study of the taxonomy and ecology of the fresh water algae. Laboratory fee, \$1.50.

†A 15B. *AQUATIC PLANTS—VASCULAR PLANTS*...U,G; 2 hrs. Prerequisite, Course 1 or its equivalent. May be taken in conjunction with 15A or independently. The lectures will cover both courses. Lectures daily except Saturday 8; laboratory and field work, TTh 2-5:30. Two all day trips. Professor MUENSCHER.

A study of the taxonomy and ecology of aquatic vascular plants. Laboratory fee, \$1.50.

†A 31. *PLANT PHYSIOLOGY*...U,G; 4 hrs. Prerequisite, General Botany or Biology, and Elementary Chemistry. Lectures, daily except Saturday 9; laboratory 10-12. 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 classrooms, on discussion of the principles and their applications to living plants. Laboratory fee, \$5.

†A 117. *TAXONOMY OF VASCULAR PLANTS*...U,G; 4 hrs. 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, and field work on the flora of the Cayuga region. Laboratory fee, \$6.

CONSERVATION

†A 8. *ELEMENTARY TAXONOMY AND NATURAL HISTORY OF VERTEBRATES*...U,G; 4 hrs. 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. 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.

†A 9. *ORNITHOLOGY*...U; 3 hrs. 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*...U,G; 3 hrs. Prerequisite, Ornithology A 9 or its equivalent. With special permission may be taken with course 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 preparation of bird skins and bird photography. Laboratory fee, \$3.

A 128. *THE HISTORY AND LITERATURE OF ORNITHOLOGY*...U,G; 1 hr. Lectures, T Th 10. Dr. E. G. ALLEN.

An introduction to the evolution of ornithology in zoological science; the leading writers and bird artists from Aristotle to the present, together with the main sources and aids for the preparation of bibliographies.

A 173. *FISHERY BIOLOGY*...U,G; 1 hr. Lectures, T Th 12. Assistant Professor WEBSTER.

A brief survey of the life histories of some of our important fresh-water game

fishes and methods employed in fishery management. The latter include stream and lake surveys, catch regulations, stocking, stream and lake improvement, food studies, age determination, and growth and population studies. In addition to the lectures, outside reading and practical exercises will be assigned.

A 400. *SPECIAL PROBLEMS IN FISHERY BIOLOGY*...U,G; 1 or 3 hrs. Assistant Professor WEBSTER.

A 403. *SPECIAL PROBLEMS IN MAMMALOLOGY*...U,G; 1 or 3 hrs. Professor HAMILTON.

A 404. *SPECIAL PROBLEMS IN ORNITHOLOGY*...U,G; 1 or 3 hrs. Professor ALLEN.

ENTOMOLOGY AND LIMNOLOGY

See also CONSERVATION.

†A 16. *INSECT ECOLOGY*...U,G; 3 hrs. Prerequisite, an introductory course in zoology or biology. Lectures, M W 8; laboratory and field work, M W 10-12:30 and M W 2-5, or by arrangement. Professor PALM.

A study of insects in relation to their environments. Lectures will deal with the general principles of insect ecology; field and laboratory work will consider ecological groups in the vicinity of Ithaca. An opportunity will be provided for life history work and for photography of insects in natural color. General procedure consists of field trips in the morning period and laboratory study of the collections during the afternoon period. Laboratory fee, \$3.

†A 30. *TAXONOMY AND NATURAL HISTORY OF INSECTS*...U,G; 3 hrs. Prerequisite, an introductory course in zoology or biology. Lectures, M W F 9; laboratory and field work, W F 2-4:30; and two other periods by arrangement. Assistant Professor PATE.

Lectures on the principles of insect classification; literature of systematic entomology; zoological nomenclature; and geographical distribution. Laboratory and field studies on orders, families, and representative species of insects, and the preparation of a collection of local insects for study. Text: Comstock's *Introduction to Entomology*. Laboratory fee, \$3.

†A 171. *FRESHWATER BIOLOGY (Limnology)*...U,G; 3 hrs. Prerequisite, an introductory course in zoology or biology. Lectures, T Th 11; laboratory and field work, T Th 8-10:30 and 2-5. Assistant Professor WEBSTER.

A field and laboratory study of some of the aquatic organisms inhabiting streams, lakes, and ponds in the vicinity of Ithaca. The principal emphasis is on the ecological relationships of the organism and its environment rather than the systematic. General procedure consists of field trips in the morning period and laboratory study of the collections during the afternoon period. Text: Needham & Loyd's *Life of Inland Waters*. Laboratory fee, \$3.

A 300. *SPECIAL PROBLEMS IN INSECT ECOLOGY*...U,G; Credit and hours to be arranged. Professor PALM.

This course may be elected by qualified persons with the permission of the instructor under whom the work is done.

A 302. *SPECIAL PROBLEMS IN INSECT TAXONOMY*...U,G; Credit and hours to be arranged. Assistant Professor PATE.

This course may be elected by qualified persons with the permission of the instructor under whom the work is done.

A 306. *SPECIAL PROBLEMS IN LIMNOLOGY*...U,G; Credit and hours to be arranged. Assistant Professor WEBSTER.

This course may be elected by qualified persons with the permission of the instructor under whom the work is done.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

Courses in this department are offered to three groups of people. Courses A 5, A 12, A 13, and A 199 are of interest to amateurs. Courses A 118, A 119, and A 199 are offered to practicing nurserymen, park and estate superintendents, landscape engineers, and architects. Courses A 12, A 13, A 118 and A 199 are given for advanced students in horticulture and landscape gardening.

†A 5. *FLOWER ARRANGEMENT*...U; 2 hrs. Lecture, T Th 9; laboratory, T Th 10-12:30. Miss HAKANSON.

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

†A 12. *HERBACEOUS PLANT MATERIALS*...U,G; 3 hrs. for new students, 2 hrs. for those who have had Floriculture 12 in the spring term. Lectures, M T W Th 8; laboratory, W Th 1:40-4:30. Miss KITAZAWA.

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. All members of the class will participate in an all-day excursion to visit private estates and public parks in Rochester. Transportation fee, \$5; laboratory fee, \$2.

†A 13. *WOODY PLANT MATERIALS FOR LANDSCAPE PLANTING*...U,G; 4 hrs. Lectures, M T W Th 9; laboratory and field work, M T W Th 10-12:30. Assistant Professor CORNMANN.

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 subjects 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. Transportation fee, \$5; laboratory fee, \$3.

†A 118. *LANDSCAPE CONSTRUCTION*...U,G; 4 hrs. 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 F 8-12 and 1-5. 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*...U,G; 3 hrs. Prerequisite, elementary courses in Botany, Plant Physiology, and Ornamental Horticulture. Lectures, M Th F 7-9 p.m.; laboratory, M T 1:40-4. 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. Transportation fee, \$3; laboratory fee, \$3.

A 199. *SPECIAL PROBLEMS*...U,G; credit and hours to be arranged. Associate Professor PORTER and members of the 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. Cost of materials dependent upon the nature of the problem.

GENETICS

†A 101. *GENERAL GENETICS*...U,G; 4 hrs. Prerequisite, a course in botany, zoology, or biology. Lectures, daily except Saturday 10; laboratory, daily except Saturday 11-12:30. Professor SMITH.

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 of eugenics. Laboratory studies of hybrid material in plants and animals and breeding experiments with *Drosophila*. Laboratory fee, \$3.

ORNITHOLOGY

See CONSERVATION.

ZOOLOGY

See also CONSERVATION.

S 103, S 104. *GENERAL ZOOLOGY*...U. Courses designed so that a student may take either or both.

†S 103. *AN INTRODUCTION TO THE INVERTEBRATES*...U; 3 hrs. Recitations, daily except Saturday 9; laboratory, M W and 1st, 3rd, and 5th F 1:40-4. Associate Professor LEONARD and assistant.

Course deals with structure and function of representative animals lacking backbones; their classification, life cycles, habits; their relation to the welfare of man; certain biological principles. Laboratory fee, \$5.

†S 104. *AN INTRODUCTION TO THE VERTEBRATES*...U; 3 hrs. Recitations, daily except Saturday 11; laboratory, T Th and 2nd, 4th, and 6th F 1:40-4. Associate Professor LEONARD and assistant.

Course deals with structure and function of the vertebrate organ systems; the principles of development, genetics, and evolution. Comparisons of frog and man will be stressed. Laboratory fee, \$5.

†S 211-212. *COMPARATIVE ANATOMY OF THE VERTEBRATES*...U,G; 6 hrs. Prerequisite, Zoology 101-102 or 103-104 or their equivalent. Lecture, daily except Saturday 10; laboratory, daily except Saturday 1-5. This course is the equivalent of Zoology 211 and 212. Associate Professor GILBERT and assistants.

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.

NUTRITION

BIOCHEMISTRY

A 101. *GENERAL BIOCHEMISTRY*...U,G; 4 hrs. Prerequisite, Quantitative Analysis and Organic Chemistry. Lectures, daily except Saturday 8-10. Associate Professor NEAL.

The chemistry of plant and animal substances and the reactions occurring in biological systems.

†A 102. *GENERAL BIOCHEMISTRY*...U,G; 2 hrs. Prerequisite or parallel course A 101. Laboratory, daily except Saturday 10-12:30. Associate Professor NEAL and assistant.

Laboratory practice with plant and animal materials and the experimental study of their properties. Laboratory fee, \$15.

NUTRITION

A 111. *LABORATORY WORK IN NUTRITION*...U,G; 3 hrs. Prerequisite, a course in quantitative analysis. Daily except Saturday 1-4. Professor McCAY and Dr. UDALL.

This course is for seniors and graduate students as described in the Graduate School Announcement, 1948-1949, page 97. It is designed to familiarize the student with the application of chemical methods to the solution of fundamental problems of nutrition. The technique of research with experimental animals such as white rats, hamsters, dogs, rabbits, and guinea pigs is taught by having the students take part in a series of short research problems.

A 215. *HISTORY OF NUTRITION*...U,G; 1 hr. T Th 4:15. Professor McCAY.

This course is primarily for graduates, but selected seniors may be allowed to enroll. It is designed to familiarize the student with the literature upon which the science of nutrition is based, and to increase the facility of the student in the use of current nutrition literature.

PHYSICAL AND MATHEMATICAL SCIENCES

ASTRONOMY

S 20. *GENERAL ASTRONOMY*...U,G; 2 hrs. Lectures daily except Saturday at 11. Associate Professor SHAW.

An illustrated lecture course designed to acquaint the student with the descriptive features of (a) the Solar System including the Sun, Planets, Moon, and Comets, and (b) the Sidereal Universe including the Stars, the Milky Way, and External Galactic Systems. Atomic structure and spectroscopy. Great telescopes of the world.

S 25. *OBSERVATIONAL ASTRONOMY*...U,G; 2 hrs. Parallel registration in S 20 or by permission. T Th 2-4:30 and a 3-hour evening session to be arranged. Associate Professor SHAW.

Observatory and laboratory work supplemented by discussion periods. Constellation study. Telescopic observations of Stars, Planets, Sun, and Moon. Optical instruments. Applied spectroscopy. Determination of latitude and longitude. Demonstration equipment and methods. Text: Shaw and Boothroyd, *Manual of Astronomy*.

CHEMISTRY

For biochemistry, see NUTRITION.

†S 105-106. *GENERAL CHEMISTRY*...U; 6 hrs. Lectures and recitations, daily except Saturday 8-10. Laboratory, daily except Saturday 10-1. Assistant Professor VAN ARTSDALEN and assistant.

For those students who intend to take more chemistry, this course serves as a prerequisite to the more advanced courses in chemistry. Secondary school chemistry is not prerequisite. May be elected by students who do not intend to take more chemistry.

Emphasis on the more important chemical principles and facts, on the scientific method, and on the relation of chemistry to the other fields of knowledge and to everyday life. Laboratory fee, \$15.

†S 201. *INTRODUCTORY QUALITATIVE ANALYSIS* (short course)...U,G; 3 hrs. Prerequisite, General Chemistry. Lectures, daily except Saturday 8; laboratory, three hours daily except Saturday between 9 and 1. Dr. SIENKO 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 205. *INTRODUCTORY QUALITATIVE ANALYSIS*...U,G; 3 hrs. Prerequisite, General Chemistry. Chemistry S 207 must be taken with 205. Lectures, daily except Saturday 8; recitations, T Th 12. Dr. SIENKO.

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 207. *INTRODUCTORY QUALITATIVE LABORATORY*...U,G; 3 hrs. Prerequisite, General Chemistry. Must be taken with Chemistry S 205. Laboratory, M W F 9-1 and T Th 9-12. Dr. SIENKO 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 215. *INTRODUCTORY QUANTITATIVE ANALYSIS* (short course)...U,G; 4 hrs. Prerequisite, Chemistry S 201 or S 205 and S 207. Lectures, daily except Saturday 8; laboratory, three hours daily except Saturday between 9 and 1. Dr. SCHERAGA 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 220. *INTRODUCTORY QUANTITATIVE ANALYSIS*...U,G; 3 hrs. Prerequisite, Chemistry S 201 or S 205 and S 207. Chemistry 222 must be taken with S 220. Lectures, daily except Saturday 8; recitations, T Th 9. Dr. SCHERAGA.

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

†S 222. *INTRODUCTORY QUANTITATIVE LABORATORY*...U,G; 3 hrs. Prerequisite, Chemistry S 201 or S 205 and S 207. Must be taken with Chemistry S 220. Laboratory, M W F 9-1 and T Th 10-1. Dr. SCHERAGA 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 303. *ELEMENTARY ORGANIC CHEMISTRY*...U,G; 4 hrs. Prerequisite, General Chemistry; Qualitative Analysis is desirable but not required. Chemistry S 305 must be taken with Chemistry S 303. Lectures, daily except Saturday 8-10. Dr. POSVIC.

A study of aliphatic and aromatic organic compounds, their occurrence, relations, and uses.

†S 305. *ELEMENTARY ORGANIC CHEMISTRY*...U,G; 2 hrs. Prerequisite, General Chemistry; Qualitative Analysis is desirable but not required. Must be taken with Chemistry S 303. Laboratory, daily except Saturday 10-12:30. Dr. DE TAR and assistant.

Laboratory experiments on the preparation and reactions of typical organic compounds. Laboratory fee, \$20.

S 307. *INTRODUCTORY ORGANIC CHEMISTRY*...U,G; 3 hrs. 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. POSVIC.

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 303 and S 305.

†S 311. *INTRODUCTORY ORGANIC LABORATORY*...U,G; 3 hrs. Prerequisite or parallel course, Chemistry S 307. Laboratory experiments and oral reviews, daily except Saturday 10-12:30. Dr. DE TAR and assistant.

The student prepares typical compounds of carbon and familiarizes himself with their properties, reactions, and relations. Laboratory fee, \$25.

†S 330. *ADVANCED ORGANIC LABORATORY*...U,G; 3 to 5 hrs. Prerequisite, a full year course in Organic Chemistry, Chemistry S 320, and consent of the instructor. Primarily for students contemplating advanced and independent work. Laboratory, hours to be arranged in the mornings. (Six working hours a week, for each credit hour.) Dr. DETAR and Dr. POSVIC.

An advanced course in organic synthetic procedures involving preparation of intermediates for organic research and use of standard reference works. Laboratory fee \$20.

S 375. *RECENT ADVANCES IN ORGANIC CHEMISTRY*...U,G; 2 hrs. Prerequisite, a full course in Organic Chemistry; Qualitative Organic Analysis is desirable but not required. Lectures, daily except Saturday 8. Dr. DE TAR.

The course will emphasize recent developments in aliphatic chemistry with a discussion of their practical applications and their theoretical significance. Among the topics to be covered are alkylation reactions, halogenations, and a discussion of ionic and free radical mechanisms.

†S 851. *INTRODUCTORY CHEMICAL MICROSCOPY*...U,G; 3 hrs. 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 characteristics and physical chemistry of crystals; lens systems and photomicrography; study of industrial materials such as textiles and paper fibers. Text: Chamot and Mason, *Handbook of Chemical Microscopy*, Vol. I. Laboratory fee \$5.

S 853. *MICROSCOPICAL QUALITATIVE ANALYSIS (INORGANIC)*...U,G; 2 hrs. Prerequisite or parallel course, S 851. Laboratory to be arranged. Professor MASON.

Laboratory practice in the analysis of inorganic substances containing the more common elements. Text: Chamot and Mason, *Handbook of Chemical Microscopy*, Vol. II.

GEOLOGY AND GEOGRAPHY

†S 101. *GENERAL GEOLOGY*...U; 3 hrs. Equivalent to General Geology 101, fall term. Lectures, daily except Saturday 9; laboratory, M W and 1st, 3rd, and 5th F 2-4:30. Associate Professor BURFOOT and Mr. NETSCHERT.

The history of geologic ideas, processes of weathering and erosion and the resulting landforms, the materials and the structure of the crust of the earth and the evolution of mountains. Laboratory studies will be in the field as well as indoors. Field studies will interpret the local geology, and indoor studies will emphasize the identification of minerals and rocks and the analysis and use of topographic maps. Laboratory fee, \$3; excursion fee to be announced at first class session, probably about \$6.

†S 102. *GENERAL GEOLOGY*...U; 3 hrs. Equivalent to General Geology 102, spring term. Prerequisite, General Geology S 101, or concurrent registration in General Geology S 101. Lectures, daily except Saturday 11; laboratory, T Th and 2nd, 4th, and 6th F 2-4:30. Professor WELLS and Mr. WILLIAMS.

Subsurface water, glaciers, origin of the earth, geologic time, climates of the past, evolution, fossil record, geological history, and origin of man. Field trips and indoor

laboratory exercises on the interpretation and use of geologic maps and the identification of fossils. Laboratory fee, \$3; excursion fee to be announced at the first class session, probably about \$6.

S 105. *GENERAL GEOGRAPHY*...U,G; 2 hrs. Daily except Saturday 10. Professor VON ENGELN.

Fundamental concepts of geography; direction and position in connection with map projections and map reading; regions of the world in terms of climatic types generally and in particular, with reference to political divisions; special attention to the tropical geopolitics in its relation to current world problems.

S 901. *SUMMER FIELD SCHOOL IN GEOLOGY*...U,G; 6 hrs. Professor NEVIN. June 13-July 23.

Registration limited to men. For full information write to the Department of Geology and Geography, McGraw Hall.

MATHEMATICS

S 161. *ANALYTIC GEOMETRY AND CALCULUS*...U; 3 hrs. Prerequisite, Trigonometry. Daily except Saturday 10.

A beginning course in the subject; the first term of a three-term course.

S 162. *ANALYTIC GEOMETRY AND CALCULUS*...U; 3 hrs. Prerequisite, Mathematics 161 or the equivalent. Daily except Saturday 10.

The second term of a three-term course.

S 163. *ANALYTIC GEOMETRY AND CALCULUS*...U; 3 hrs. Prerequisite, Mathematics 162 or the equivalent. Daily except Saturday 9.

The third term of a three-term course.

S 201. *DIFFERENTIAL EQUATIONS*...U,G; 3 hrs. Prerequisite, Mathematics 163 or the equivalent. Daily except Saturday 10.

A beginning course in the subject.

S 405. *HIGHER ANALYTIC GEOMETRY*...U,G; 3 hrs. Prerequisite, Mathematics 161, 162, 163 or the equivalent. Daily except Saturday 11. Mr. Yoon.

A study of curves and surfaces by means of Cartesian and homogeneous coordinates.

METEOROLOGY

A 1A. *METEOROLOGY*...U,G; 2 hrs. 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. It is strongly advised that students elect course A 1B (the laboratory work) to go with this course. Students taking the course at the graduate level will be assigned additional work.

A 1B. *METEOROLOGY, LABORATORY COURSE*...U,G; 1 hr. T Th 8-10 or 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*...U,G; 1 hr. 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*...U,G; 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

DEMONSTRATION LECTURES...A series of experimental demonstrations covering the entire field of physics. Little time will be spent on the development of the related theory, this being left for the classroom work of courses S 103 and S 104, of which these lectures are a part. Teachers may find in these demonstrations valuable suggestions for their own work. Daily, 8. Rockefeller A, B. Professor HOWE.

†S 103. *INTRODUCTORY EXPERIMENTAL PHYSICS*...U,G. 3 hrs. Demonstration lectures, M T W 8. Recitations, M T W 9. Three laboratory periods, Th F and one as arranged 2-4. Professor HOWE.

Mechanics, heat, and sound. Laboratory fee, \$5.

†S 104. *INTRODUCTORY EXPERIMENTAL PHYSICS*...U,G; 3 hrs. This course must be accompanied by course S 103 or preceded by a study of mechanics in either high school or college physics. Demonstration lectures, Th F S 8. Recitations, Th F S 9. Three laboratory periods a week, T W and one as arranged 2-4. Professor HOWE.

Electricity and light. Laboratory fee, \$5.

†S 115. *MECHANICS*...U,G. 3 hrs. Prerequisite, Calculus or simultaneous registration in Mathematics 161. Lectures, T Th 11; recitations, daily, except Saturday, 9. Laboratory, M W F 2-4:30. Associate Professor NEWHALL.

This course is the first term of a four-term sequence in General Physics required of students of engineering. The course includes all of the mechanics of the sequence. Laboratory fee, \$5.

†S 117. *ELECTRICITY AND MAGNETISM*...U,G. 3 hrs. Prerequisites, Physics 115, and Calculus or simultaneous registration in Mathematics 163. Lectures, W F 11; recitations daily, except Saturday, 8 or 10. Laboratory, M W F 2-4:30. Associate Professor NEWHALL.

This course constitutes the third term of a four-term sequence in General Physics required of students of engineering. The course includes all of the fundamentals of the electricity and magnetism of the sequence. Laboratory fee, \$5.

†S 210. *ADVANCED LABORATORY*...U; 3 hrs. Prerequisites, Physics 117 and 118, or 205 and 206. Laboratory daily, except Saturday, 2-4:30, and one forenoon. Discussion period to be arranged. Associate Professor TOMBOULIAN.

A laboratory course designed to meet the needs of individual students. Selected experiments from the fields of acoustics, optics, spectroscopy, electrical circuits, electronics. Laboratory fee, \$5 a credit hour.

S 225. *ELECTRICITY AND MAGNETISM*...U,G. 3 hrs. Prerequisite, Physics 117 or 206. Lectures, daily 9, and Saturday 10. Associate Professor TOMBOULIAN.

An introduction to the theory of the electromagnetic field. Static and dynamic fields, dielectrics and properties of magnetic materials, the field equations and electromagnetic waves in free space, the Poynting vector.

PHYSICAL EDUCATION

†S 18A. *PRIVATE INSTRUCTION IN TENNIS*...No credit. For men and women. Hours to be arranged.

Eight lessons and two lectures. Fee, \$12.

†S 18B. *PRIVATE INSTRUCTION IN GOLF*...No credit. For men and women. Hours to be arranged.

Twelve lessons. Fee, \$15.

Officers

Edmund Ezra Day, Ph.D., LL.D., President of the University.
Carleton Chase Murdock, Ph.D., Dean of the University Faculty.
Charles Williams Jones, Ph.D., Dean of the Graduate School.
Frederick Harry Stutz, Ph.D., Director of the Summer Session.
William Arthur Smith, Ph.D., Assistant Director of the Summer Session.

Faculty

Harold Herbert Abelson, Ph.D., Professor and Director of the Educational Clinic, College of the City of New York.
Bristow Adams, B.A., Professor of Extension Service, Emeritus.
Donald Keith Adams, Ph.D., Professor and Chairman of the Department of Psychology, Duke University.
George Plimpton Adams, Ph.D., Associate Professor of Economics.
Frederick B. Agard, Ph.D., Associate Professor of Romance Linguistics.
Ann McIntyre Aikin, Ph.D., Assistant Professor of Home Economics.
Edward W. Aiton, Field Agent, Extension Service, U. S. Department of Agriculture, Washington, D. C.
Harry Darkes Albright, Ph.D., Associate Professor of Speech and Drama.
Arthur A. Allen, Ph.D., Professor of Ornithology.
Elsa Guerdrum Allen, Ph.D., Instructor in Ornithology.
Lucile Allen, Ed.D., Dean of Women.
Robert N. Allen, B.S.A.E., Instructor in Mechanical Engineering.
Francis E. Almstead, M.S., Curriculum Coordinator for the New York State Technical Institutes, Department of Education, Albany, New York.

- Roger John Amorosi, B.E.E., Instructor in Electrical Engineering.
Paul Denzil Ankrum, M.S.E., Associate Professor of Electrical Engineering.
Robert Cecil Bald, Ph.D., Professor of English.
Robert Dodge Baldwin, Ph.D., Professor of Educational Administration, West Virginia University.
Mary Barrett, M.A., Assistant Professor of Home Economics.
Milton Barron, Ph.D., Assistant Professor of Sociology.
Edward Lewis Bassett, Ph.D., Assistant Professor of Classics.
Thomas Livingstone Bayne, Jr., Ph.D., Associate Professor of Rural Education.
C. Kenneth Beach, Ph.D., Professor of Industrial Education.
Sara E. Blackwell, M.S., Assistant Professor of Home Economics Education.
Marvin Bogema, M.C.E., Associate Professor of Civil Engineering.
Oets Kolk Bouwsma, Ph.D., Professor of Philosophy, University of Nebraska.
Landis Lee Boyd, M.S., Assistant Professor of Agricultural Engineering.
Laurence C. Boylan, M.S. in Ed., Director of Guidance, Gloversville Public Schools, Gloversville, New York.
Muriel Brasie, M.A., Associate Professor of Home Economics.
Charles Arthur Bratton, Ph.D., Associate Professor of Farm Management.
Margaret Jane Brennan, M.A., Instructor in Home Economics.
Herbert Whittaker Briggs, Ph.D., Professor of Government.
Urie Bronfenbrenner, Ph.D., Professor of Psychology.
Earl Brooks, M.S., Professor of Industrial and Labor Relations.
John M. Brophy, Ph.D., Assistant Professor of Industrial and Labor Relations.
Nelson Howard Bryant, M.E.E., Assistant Professor of Electrical Engineering.
James Dabney Burfoot, Ph.D., Associate Professor of Geology.
Alice M. Burgoin, M.S., Associate Professor of Home Economics.
Arthur Houghton Burr, Ph.D., Professor of Machine Design.
Earle Nelson Burrows, M.C.E., Associate Professor of Structural Engineering.
Julian Edward Butterworth, Ph.D., Professor of Rural Education.
John D. M. Cameron, B.M.E., Instructor in Mechanics.
William Alexander Campbell, M.A., Assistant Professor of Music.
Helen Canon, Ph.D., Professor of Home Economics.
Robert Rose Carson, M.A., Instructor in Speech and Drama.
Robert Carter, Ph.D., Associate Professor of Agricultural Economics, University of Vermont.

- Daniel Grover Clark, Ph.D., Professor of Botany.
Robert Crowthers Clark, M.S., Associate Professor of Sociology.
Robert Theodore Clausen, Ph.D., Associate Professor of Botany.
Harold Clough, Instructor in Agricultural Engineering.
John Farnsworth Cornman, Ph.D., Assistant Professor of Ornamental Horticulture.
Esther Crew, M.S., Instructor in Home Economics.
Kathleen Cutlar, M.S., Assistant Professor of Home Economics.
David Daiches, D.Phil., Professor of English.
George Irving Dale, Ph.D., Professor of Romance Literature.
Robert H. Dalton, M.A., Professor of Home Economics.
Norman David Daly, M.A., Associate Professor of Fine Arts.
C. Douglas Darling, M.D., Professor of Clinical Medicine.
Alfred Emerys Davies, M.S.E., Assistant Professor of Electrical Engineering.
Carol Dayton, A.B., Assistant in Nursery School.
DeLos De Tar, Ph.D., Instructor in Chemistry.
Alan S. Downer, M.A., Assistant Professor of English, Princeton University.
David Dropkin, Ph.D., Associate Professor of Mechanical Engineering.
Alexander M. Drummond, L.H.D., Professor of Speech and Drama.
William R. Dymond, B.A., Instructor in Economics.
Robert Henry Elias, Ph.D., Instructor in English.
Lloyd H. Elliott, Ph.D., Assistant Professor of Secondary Education.
Frederick Seward Erdman, Ph.D., Associate Professor of Mechanical Engineering.
William Harry Erickson, M.S. in E.E., Associate Professor of Electrical Engineering.
Myrtle H. Ericson, M.S., Assistant Professor of Home Economics.
Harold Feldman, M.A., Instructor in Home Economics.
Robert H. Ferguson, Ph.D., Assistant Professor of Industrial and Labor Relations.
Grace M. Foster, M.A., Associate Professor of Home Economics.
Walter Hoyt French, Ph.D., Associate Professor of English.
Norman Russell Gay, M.S., Associate Professor of Mechanical Engineering.
Howard Merrill Giffit, M.S.C.E., Professor of Sanitary Engineering.
Perry Webster Gilbert, Ph.D., Associate Professor of Zoology.
Eva L. Gordon, Ph.D., Assistant Professor of Rural Education.
Frederick O. Gutheim, A.B., Visiting Lecturer in Housing and Design.
Vera Hakanson, B.S., Instructor in Floriculture.
Robert A. Hall, Jr., Ph.D., Associate Professor of Romance Linguistics.
William John Hamilton, Ph.D., Professor of Zoology.

- Katharine Harris, M.A., Professor of Home Economics.
William Herman Hartwig, B.S.E.E., Instructor in Electrical Engineering.
Baxter Hathaway, Ph.D., Assistant Professor of English.
Hazel M. Hauck, Ph.D., Professor of Home Economics.
Layton S. Hawkins, M.A., Director of Educational Research for the American Technical Society.
Erik Karl Henriksen, M.S., Associate Professor of Mechanical Engineering.
Marion Hillhouse, M.A., Associate Professor of Home Economics.
Rolland Theodore Hinkle, Ph.D., Associate Professor of Mechanical Engineering.
Helen Paine Hoefer, M.S. in Ed., Associate Professor of Home Economics Education.
Edwin Raymond Hoskins, Ph.D., Associate Professor of Rural Education.
Harley Earl Howe, Ph.D., Professor of Physics.
Robert Leslie Hull, Ph.D., Associate Professor of Music.
Margaret Hutchins, Ph.D., Professor of Home Economics Education.
David Hyatt, M.S., Assistant Professor of Industrial and Labor Relations.
J. James Jehring, M.A., Assistant Professor of Industrial and Labor Relations.
William A. Jewett, Jr., M.F.A., Instructor in Speech and Drama.
Merle John Kelly, M.S., Assistant Professor of Electrical Engineering.
George W. Ketcham, M.S., Supervisor of Industrial Arts, State Department of Education, Hartford, Connecticut.
May Kitazawa, B.S., Instructor in Floriculture.
Loretta Klee, M.A., Director of Social Studies, Ithaca Public Schools.
Paul Jehu Kruse, Ph.D., Professor of Extension Education.
Elwood Albert LaFortune, M.A., Vice-Principal of Ithaca High School and Director of Guidance, Ithaca Public Schools.
Harry K. Lane, B.A., Instructor in Bacteriology.
Olaf Frederick Larson, Ph.D., Associate Professor of Sociology.
J. Paul Leagans, M.S., Professor in Extension.
Samuel Leeson Leonard, Ph.D., Associate Professor of Zoology.
Taylor Lewis, B.S. in C.E., Associate Professor of Civil Engineering.
Lisle L. Longsdorf, M.E., Professor in Extension, Kansas State College of Agriculture.
Robert Mains, Ph.D., Associate Professor of Structural Engineering.
Berenice Mallory, Ph.D., Program Specialist, Home Economics Education Service, U. S. Office of Education, Washington, D. C.
Frederick George Marcham, Ph.D., Professor of History.
Frederick L. Marcuse, Ph.D., Assistant Professor of Psychology.

- Clive Maine McCay, Ph.D., Professor of Animal Nutrition.
Clyde Ira Millard, E.E., Professor of Industrial and Engineering Administration.
Aimee Moore, M.A., Instructor in Home Economics.
Clyde B. Moore, Ph.D., Professor of Rural Education.
Richard A. Mordoff, Ph.D., Professor of Meteorology.
Helen E. Moser, M.A., Assistant Professor of Home Economics Education.
William G. Moulton, Ph.D., Associate Professor of Germanic Linguistics.
Walter C. Muenscher, Ph.D., Professor of Botany.
Walter Lynn Murdock, A.B., Instructor in Mathematics.
Henry Alonzo Myers, Ph.D., Professor of English.
Arthur Leslie Neal, Ph.D., Associate Professor of Biochemistry.
A. Gordon Nelson, Ph.D., Associate Professor of Educational and Vocational Guidance.
Bruce Carlton Netschert, A.B., Assistant in Geology.
Curtis Putnam Nettels, Ph.D., Professor of History.
Charles Merrick Nevin, Ph.D., Professor of Geology.
Herbert Frank Newhall, Ph.D., Associate Professor of Physics.
Milacent Grimes Ocvirk, M.A., Director of English, Ithaca Public Schools.
Roy A. Olney, Ph.D., Professor of Rural Education.
Robert E. Osborn, B.S.E.E., Associate Professor of Electrical Engineering.
Delos Otis, Ph.D., Dean of Instruction in Business Administration, Sampson College.
Donald Paarlberg, Ph.D., Assistant Professor of Agricultural Economics, Purdue University.
Charles Edmund Palm, Ph.D., Professor of Entomology.
Vernon S. L. Pate, Ph.D., Assistant Professor of Entomology.
Irene Patterson, M.S., Associate Professor of Home Economics Education.
Catherine J. Personius, Ph.D., Professor of Home Economics.
Loren C. Petry, Ph.D., Professor of Botany.
Clare William Pierce, Ph.D., Professor of Agricultural Economics, Pennsylvania State College.
Joseph Pullman Porter, M.L.D., M.S.A., Associate Professor of Ornamental Horticulture.
Harvey Posvic, Ph.D., Instructor in Chemistry.
Alfred M. S. Pridham, Ph.D., Associate Professor of Ornamental Horticulture.
Wilma Pugh, Ph.D., Assistant Professor of History, Mount Holyoke College.

- Mary E. Purchase, M.S., Instructor in Home Economics.
Harold W. Ranney, M.A., Supervisor of Teacher Training, New York State Department of Education.
Harold Lyle Reed, Ph.D., Professor of Economics.
William Reeder, Ph.D., Assistant Professor of Sociology.
Katherine Reeves, A.B., Associate Professor of Home Economics.
Helen Ripley, M.S., Assistant Professor of Home Economics.
Edward M. Roden, M.A., Supervisor of Teacher Training, New York State Department of Education.
Helen B. Ross, M. S., Instructor in Rural Education.
Clinton L. Rossiter, Ph.D., Assistant Professor of Government.
Joseph L. Rosson, B.S. E. E., Instructor in Electrical Engineering.
William Merritt Sale, Jr., Ph.D., Professor of English.
Martin Wright Sampson, Jr., M.S., Assistant Professor of Industrial and Engineering Administration.
Byron Winthrop Saunders, M.S., Assistant Professor of Mechanical Engineering.
Stanley Lewry Schauss, Sc.M., Associate Professor of Electrical Engineering.
Harold A. Scheraga, Ph.D., Instructor in Chemistry.
Victor E. Schmidt, Ph.D., Assistant Professor of Science Education.
Robert William Shaw, Ph.D., Associate Professor of Astronomy.
James Morgan Sherman, Ph.D., Professor of Bacteriology.
Michell Joseph Sienko, Ph.D., Instructor in Chemistry.
Harold Hill Smith, Ph.D., Professor of Plant Breeding.
Alpheus W. Smith, Ph.D., Professor of Industrial and Labor Relations.
Lawrence Byron Spencer, E.E., Assistant Professor of Electrical Engineering.
Margaret Morehead Squire, B.M., Instructor in Music.
Walter Hutchinson Stainton, Ph.D., Associate Professor of Speech and Drama.
Clifford Nicks Stark, Ph.D., Professor of Bacteriology.
Grace Steininger, Ph.D., Professor of Home Economics.
Clara Straight, M.A., Instructor in Home Economics.
Marc Szeftel, Ph.D., Associate Professor of History.
Philip Taietz, M.A., Assistant Professor of Sociology.
Joseph G. Tarboux, Ph.D., Professor of Electrical Engineering.
Romeyn Y. Thatcher, C.E., Professor of Civil Engineering.
Charles Kenneth Thomas, Ph.D., Professor of Speech.
Diran Hagopos Tombouljian, Ph.D., Associate Professor of Physics.
Thomas Broadhead Tracy, M.M.E., Assistant Professor of Mechanical Engineering.
Virginia True, M.F.A., Professor of Home Economics.
David Gordon Tyndall, M. A., Assistant Professor of Economics.

- Robert Udall, D.V.S., Assistant in Nutrition.
Charles H. Uhl, Ph.D., Assistant Professor of Botany.
Robert H. Underwood, B.M.E., Instructor in Mechanics.
Ervin R. Van Artsdalen, Ph.D., Assistant Professor of Chemistry.
Oskar Dietrich Von Engeln, Ph.D., Professor of Geology, Emeritus.
Frederick O. Waage, Ph.D., Professor of Fine Arts.
Eyvind Bernard Wahlgren, M.S., Assistant Professor of Agricultural Engineering.
Ethel B. Waring, Ph.D., Professor of Home Economics.
Stanley Whitson Warren, Ph.D., Professor of Farm Management.
Edwin B. Watson, M.S., Associate Professor of Mechanical Engineering.
Dwight Albert Webster, Ph.D., Assistant Professor of Limnology and Fisheries.
John West Wells, Ph.D., Professor of Geology.
Vivian White, M.S., Instructor in Home Economics.
Herbert August Wichelns, Ph.D., Professor of Speech.
George Quigg Williams, M.S., Assistant in Geology.
Miriam T. Williams, B. Arch., Registered Practicing Architect and City Planning Consultant, Gadsden, Alabama.
Robert K. Williams, B. Arch., Registered Practicing Architect and City Planning Consultant, Gadsden, Alabama.
Lucille J. Williamson, Ph.D., Associate Professor of Home Economics.
Meredith C. Wilson, B.S., Chief of the Division of Field Studies and Training, U. S. Department of Agriculture.
Andrew Leon Winsor, Ph.D., Professor of Rural Education.
Marion Wood, M.S., Assistant Professor of Home Economics.
Florence E. Wright, M.S., Associate Professor of Home Economics.
Forrest Blythe Wright, Ph.D., Professor of Agricultural Engineering.
Bertram Yood, Ph.D., Instructor in Mathematics.

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