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NORTH CAROLINA STATE COLLEGE
OF
AGRICULTURE AND ENGINEERING
OF THE
UNIVERSITY OF NORTH CAROLINA
STATE COLLEGE STATION
RALEIGH

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OF AGRICULTURE AND ENGINEERING

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SUMMER SESSION, 1935

In accordance with the plans that are being carried out in the consolidation of the Greater University of North Carolina, the summer schools of the University at Chapel Hill, of the State College of Agriculture and Engineering at Raleigh, and the Woman's College at Greensboro have been united into one organization. Beginning with this year the summer term will be conducted as an integral part of the regular college year under the guidance of the regular administrative staff.

The work of the three divisions will be arranged according to function. Elementary Education will be the distinctive field of work at Greensboro; Agricultural, Vocational and Technological training at State College; and Secondary Education and Graduate work the distinctive field at Chapel Hill.

There will be a single session of six weeks at all three of the institutions, with a second term of six weeks at Chapel Hill only. The work of the three institutions is being correlated and coordinated in such a way that the students and teachers of the State may be better served than hitherto.

The twenty-second Summer Session of the North Carolina State College of Agriculture and Engineering of the University of North Carolina, begins Wednesday, June 13th, and closes Tuesday, July 24th. In the courses given, the work will be directed primarily to the needs of the teachers in secondary education and to the regular college students working for a degree. The usual technical courses will also be offered, as well as courses for teachers of Industrial Arts who hold a certificate of Grammar Grade C or higher.

In addition to the subject-matter courses open to all students who have graduated from high school and particularly suitable for those persons preparing to teach in the secondary schools, there will be the usual methods courses.

The State College Summer School is desirous of using its faculty and laboratories, which are particularly well prepared and equipped in the scientific and technical fields, to meet the rapidly developing needs of the State.

AGRICULTURE

It is the purpose of the Summer School of State College to render every possible service to the farmers of North Carolina and to all those interested in helping the farmers with their many intricate problems. The "New Deal" in agriculture calls for an entirely new approach to the whole farm situation. The Agricultural College, including the Experiment Station, occupies a position of leadership in this field, and will offer during the Summer School courses for teachers, students in agriculture, farmers and any others wishing to take advantage of the facilities of the College.

COTTON CLASSING

The Cotton Classing Course in the Summer School offers intensive work in the grading and stapling of cotton.

The course consists of lectures and daily practice in grading and stapling, according to the "Universal Cotton Standards."

This work is designed to prepare men to enter the cotton business and to give intensive training for men who are now in active service. (See description of the course on page 27.)

HIGH SCHOOL PRINCIPALS AND SCIENCE TEACHERS

There will be offered for principals and teachers of high schools, both professional and subject-matter courses. Special courses in methods of teaching high school science, together with courses in the various physical sciences, will occupy a large place in the Summer School. This is made necessary by the demand throughout the State for professionally trained teachers of science in the secondary schools. Teachers planning to take these courses are requested to bring their high school texts.

CURRICULUM STUDY PROGRAM IN NORTH CAROLINA

The Summer School at State College will be definitely identified with the curriculum construction program which is being carried on by the State Department of Public Instruction.

The curriculum materials gathered this year by committees and individual teachers are to be criticized, evaluated, and as far as possible prepared as new courses of study in the various subject matter fields.

Courses distinctly for teachers in special professional fields, appearing in this catalogue, may be changed in content and credit hours, or new courses introduced, in order to cooperate with the State Department of Public Instruction. This will provide opportunity for teachers interested in these special fields to devote the full time of one or more courses studying these problems. Full information regarding the specialized fields in which this institution will cooperate will be announced by the State Department of Public Instruction.

INDUSTRIAL ARTS

During the Summer School emphasis will be given to the preparation of teachers of industrial arts for the various communities of North Carolina. The rapid growth of industrial education in our State is creating a demand for supervisors and teachers who are competent to develop it in the right direction. Courses will be given in shop practice, mechanical drawing, methods of teaching, subject-matter, and administration.

Supervisors and teachers are needed for the work in the junior and senior high schools, part-time and continuation schools, and evening schools. The need is for those who are familiar with both general and vocational education and are capable of placing the proper emphasis on the courses to be outlined for a particular locality.

Industrial arts education depends largely upon the soundness of the philosophy concerning the type of training which underlies the introduction of industrial studies. For this reason those professionally minded teachers with vision will welcome courses giving them a better basis for their work in the classroom.

The purpose of the courses in Industrial Arts for the Elementary School is to create interest in these problems using them to motivate the elementary school subjects and to prepare teachers and supervisors who will become leaders in introducing this work in their school systems. Credit for these courses may be used either in raising or renewing certificates.

Teachers desiring to raise or renew their certificates will take the first two of the courses in the list following, and one course selected from the remainder of the list.

Ed. s353. The Theory of Industrial Arts. Five hours a week; three credits.

- *Ed. s354. **Practical Arts Problems.** Ten hours a week; three credits.
- Tex. s115. **Courses for Teachers.** Four hours a week; two credits.
- Ed. s203b. **Educational Psychology.** Five hours a week; three credits.
- Ed. s320. **Vocational Guidance.** Five hours a week; three credits.
- *Ed. s355. **Art Studies in Industrial Arts Problems.** Ten hours a week; 1½ or 3 credits.
- *Ed. s381. **Guidance and Discipline of Students.** Five hours a week; three credits.

NOTE.—The above courses are described elsewhere in this bulletin.

TEXTILES

The Textile School at State College occupies a place of merited leadership in this country. A State with North Carolina's rank in the textile field needs to take advantage of the latest things in research and training in this North Carolina's largest industry. The Textile School offers its equipment and faculty to the people of the State during the Summer School.

Courses in textiles designed for men who are employed in the manufacturing plants, as well as courses for teachers who are employed in the textile communities, will be given. These courses will be arranged on a unit basis in order to meet the needs of the various groups who may wish to come to the College for different periods.

VOCATIONAL GUIDANCE

Guidance is recognized as a part of the work of each teacher in the school. Pupils of all ages require assistance in their growth and progress through their school problems. Each stage of school development as elementary, junior high, senior high, and college requires special attention which the individual teacher may render. In addition to the work done in the classroom, there is that of the school counselor and director of the work whose duty it is to provide materials and programs of work, together with the care of such special cases as requires specific aid.

Vocational Guidance, Ed. s320, is a beginning course for advanced undergraduates and graduates, also for teachers in service who wish to help in guidance activities. Occupational Counseling, Ed. s412, is a graduate course for those who have had Ed. s320 and some experience in teaching, and those who have had a wider experience in school and industry. Closely correlated with these courses are those in psychology, sociology, economics and testing.

PHYSICAL EDUCATION AND COACHING

The Summer School will offer opportunity for coaches and teachers of physical training to take specialized courses in the Department of Physical Education. The courses in athletic coaching and physical training are arranged especially for instructors already engaged in teaching during the regular school year and for others who wish to supplement the preparation they may have received in college. The courses take up the more important problems of coaching, and are designed for the purpose of fitting men more completely to take charge of athletics and physical training in schools and colleges throughout the country, and for fitting women to coach basketball, and direct physical training programs.

The College has now arranged physical education as one of the options in the training of high school teachers. This permits a student to elect

*A fee of \$1.00 will be charged those taking Ed. s354 and Ed. s355 to pay for the materials used.

physical education as one of the fields in which he is preparing to teach, and by completing the requirements of this option, and one other, to be certified by the State Department of Education to teach in the two fields. The College has not been able to supply the demand for men with this training.

Leaders in education now recognize the fundamental need of athletics as an important part of any broad educational program. The demand for competent teachers, supervisors, and directors far exceeds the supply. This is especially true in case of men qualified both in coaching and in conducting classes in physical training. Our schools are seeking men who are college trained to take charge of their athletics; men who are versed in all phases of athletic coaching and administration. Approximately thirty-six states in the Union now have adopted legislation making physical education a prescribed part of the elementary and secondary school program.

MUSIC AND ASSEMBLIES

The success of the musical organizations of the Summer School under the direction of Mrs. Lillian Parker Wallace has elicited favorable comment from friends throughout the city. These are voluntary organizations and Mrs. Wallace kindly gives her services to these groups without charge. Students interested in music should by all means bring their musical instruments with them.

Only one assembly period per week will be provided. Interesting programs will be arranged for each of these. All students and faculty members are expected to attend these assemblies.

RECREATION

There will be supervised recreation, consisting of tennis tournaments, baseball, volleyball, basketball and handball. Instruction in swimming will be provided for both men and women. The new swimming pool, lockers and showers, and other gymnasium facilities will be available to all students.

A popular occasion during the 1934 Summer School was the ALL COLLEGE PARTY. These parties give an opportunity for the students and faculty to know each other better by playing and dancing together. More of these will be provided in 1935.

COLLEGE CREDIT

Beginning with 1924-1925, the regular session of State College was divided into three terms; consequently "credit," as used throughout this bulletin, refers to term credit, or twelve weeks work, unless otherwise designated. Therefore, in order for the college-credit courses to count for a full term's work, they will be given, if for five credits, ten periods a week; if for three credits, five periods a week. Since, however, no student will be allowed to take more than eighteen hours of work per week without special permission, this restriction will prevent student's taking more than one ten-period course.

Thirty days of work during the six weeks will be accepted as meeting Summer School requirements if all the demands of the course are met. This includes one day for registration and one day for examination.

The courses for college credit are open to graduates of standard high schools, and to others of equal qualifications. These courses give college students the opportunity to remove conditions, so that they may enter their classes in the fall in full standing. They will also make it possible to secure advanced credit. The college-credit courses are also open to teachers who hold standard State certificates.

All professional courses offered will have value both for teachers' certificates and for college credit. The subject-matter courses may be counted by teachers for academic credit towards securing or raising their certificates.

PROVISION FOR BOTH MEN AND WOMEN

All courses are open to both men and women. Special accommodations in the dormitories are provided for the women, and special attention will be given to their comfort and welfare.

The fifth dormitory will be set apart for women in attendance upon the Summer School and will be under the supervision of Mrs. Mary Smithwick, who has served so efficiently for several summers. The sixth dormitory will be reserved for married couples wishing to attend Summer School.

The variety of courses offered during the State College Summer School should appeal not only to those women in the teaching profession, but to those who are interested in taking advantage of these courses in preparation for other vocations and leading toward a college degree. Young women living in Raleigh and in nearby territory who are working for a college degree should take advantage of this opportunity.

EDUCATIONAL FORUM

An open forum for discussion of timely subjects in the several larger fields of study in the College will be conducted for the benefit of Summer School students. These meetings will consist of an opening lecture by a recognized leader in his field, followed by a period of round table conference. These meetings will be as frequent as the attendance and interest will warrant.

PERSONAL PROBLEMS CONFERENCE

In view of the unusually difficult conditions under which teachers are working, the Summer School is providing for a weekly conference period of faculty and students for the consideration of urgent problems in fields in which students may not be able to get sufficient information and help in regular courses. The conference plan will have the advantage of having a number of faculty members in attendance to bring in their individual experience and points of view bearing on the problem under consideration. This plan aims to afford students the opportunity to have light thrown upon just as many of their general and individual problems as possible.

OPPORTUNITY FOR INTERVIEWS

Members of the faculty will maintain office hours for consultation with students on problems related to their respective fields of work.

In addition to regular personal and professional assistance the State College faculty is always anxious to give, it should be of tremendous value to teachers to attend Summer School in Raleigh where they are in easy access to the various State departments. This is especially true in connection with personal interviews teachers may arrange with heads of divisions in the State Department of Education. The Director's office will be glad to aid in arranging for these interviews.

SPECIAL FEATURES

A reception for students and faculty, followed by other social and recreational events such as week-end picnics and excursions, serve to foster a congenial spirit in the student body, as well as to keep students physically and mentally fit for efficient study.

FEES AND EXPENSES FOR SIX-WEEKS PERIOD

All fees and other charges are payable in advance or upon registration, and all checks should be payable to North Carolina State College.

Room Rent (per person).....	\$ 7.50
Board at College Cafeteria.....	30.00
COLLEGE FEES	
For Residents of North Carolina.....	27.50
For Non-Residents	40.00

All students occupying a room alone will be charged \$10.00.

Students taking in excess of the normal load of three courses, not exceeding eleven credits, will be charged a fee of \$5.00 for each additional course. Double courses will be counted as two courses.

There will be a key deposit of twenty-five cents, which amount will be refunded when the key is returned.

BOARD AND LODGING

The College dining room will not be kept open during Summer School. The cafeteria, which is in the same building with the dining room, will be run for the benefit of the Summer School students and faculty.

A great many members of the faculty and regular college students eat in the cafeteria and find it very satisfactory, and about as cheap as the dining room, with the addition of greater variety from which to select, and longer periods in which to eat. The cafeteria charges are reasonable. Students may pay for meals a la carte or they may buy tickets for the six weeks for \$30.00.

Students will be assigned to rooms upon their arrival at the College. In case it is desired to change the room assignments, permission to do so must first be obtained from the Superintendent of Buildings. In no case may a room be taken until it has been regularly assigned.

WHAT STUDENTS NEED FOR THEIR ROOMS

The College rooms are supplied with necessary furniture. Each student, however, should bring towels, sheets, one pillow and two pillow cases, and two bedspreads for a single bed.

REGISTRATION

All registrations will be conducted in Frank Thompson Gymnasium beginning at 9 a.m., on June 12th. Students are expected to report in person on Wednesday, June 12th, so that they may begin class work on the morning of Thursday, June 13th, at 8 o'clock. Deans and Directors of Instruction will be present to advise students relative to courses. The administration reserves the right to cancel any course for which the registration is less than eight.

DIPLOMAS

Students expecting to receive a degree at the end of the Summer School should come to the Office of Registration early in the session and check up on all credits; also check their names as to correctness of spelling, etc., in order that they may appear properly upon the diploma.

HOURS OF WORK

It is important to notice that teachers are required to take at least fifteen hours weekly in order to receive credit for one summer session.

Additional credits may be taken by students if they have points to justify, and by teachers on approval of the Director. However, a fee of \$5.00 will be charged for the extra course above the three allowed as a normal load, in no case to exceed eleven credits. In no case will a student be allowed more than twelve credits per week. Each student will be allowed to audit a class five times, if agreeable to instructor.

THE ATTRACTIONS OF RALEIGH

Being the capital of one of the original thirteen states, Raleigh is unusually rich in historical collections, fine public buildings, and interesting places and memorials. It is interesting, also, for its churches, its schools, its hotels, its office buildings, and its growing commercial and industrial activities. Opportunities will be given the students to visit the places of interest.

The various churches welcome all Summer School students to Sunday school and church services, and their pastors have taken a very friendly interest in the morning services at the College auditorium. Raleigh will be found in all respects a delightful place of residence.

THE SOCIAL CENTER

The Y. M. C. A. building will be the social center of the school. This building contains a reading room, and auditorium, several reception rooms, telephone booths, and other conveniences for the promotion of the social life of the students.

THE D. H. HILL LIBRARY

The Library contains over 35,000 bound volumes, exclusive of government publications and much unbound material. More than 500 periodicals are received currently. The Library is a depository for the publications of the United States government and also receives practically all the experiment station publications from the different states. In addition there is a collection of foreign agricultural documents.

Two reading rooms afford an opportunity for study under pleasant conditions. A trained staff is available to render efficient service to the borrowers.

In addition to the resources of the D. H. Hill Library, the facilities of the Olivia Raney Library and the State Library will be available to Summer School students for reference work.

FRANK THOMPSON GYMNASIUM

The Frank Thompson Gymnasium is without doubt the finest and best equipped gymnasium in the South. The main floor is 130 by 110 feet, with an inter-collegiate basketball court of maximum size, and seating capacity for 2,500 spectators without using the gallery. Two maximum sized cross courts make it possible to run off class and tournament games. The auxiliary gymnasium or exercise room is 110 by 40 feet. Both of these rooms are equipped with full gymnasium apparatus and handball courts. The basement is fitted up with 1,000 private steel combination lockers. Team training rooms, equipped with private showers and lockers, a towel service room, an equipment room, and a wrestling and boxing room compose one-half of the basement. The other half is given over to the armory.

The swimming pool is located in an annex amply lighted both by windows and skylights, and finished with white tile. The pool is 75 by 30 feet, with room sufficient to accommodate several hundred spectators.

MEETING OF TEACHERS OF AGRICULTURE AND YOUNG TAR HEEL FARMERS

The annual conference of North Carolina teachers of vocational agriculture and the annual meeting of Young Tar Heel Farmers, a statewide organization of students of vocational agriculture, will be held at State College, June 17-22.

SCHOOL FOR JANITORS AND FIREMEN

The Mechanical Engineering Department of North Carolina State College, as a feature of the Summer School, conducts a short course of six days for white janitors and firemen, teaching the fundamental principles of combustion, how to fire economically, and general instructions about heating systems and operation of the plant. The mornings are given to lectures and talks by members of the College faculty and representatives from other State departments, and the afternoons are given over to the practical problems and to inspection trips to different schools. The total cost which includes cost of registration and room rent will not exceed \$3.00. Board is not furnished, but can be secured from the College Cafeteria. The 1935 school will be held the week of July 22-27. Applications for admission should be sent to Professor L. L. Vaughan, North Carolina State College, Raleigh, North Carolina.

COURSES TO BE OFFERED IN THE SUMMER SESSION

ABBREVIATIONS FOR BUILDINGS

C.—Ceramic	Pr.—Primrose
G.—Gymnasium	Pt.—Patterson
H.—Holladay	R.—Ricks
P.—Page	T.—Textile
P. & E.—Physics and Electrical Engineering Building	Pl.—Pullen Hall
Pe.—Peele Hall	W.—Winston
Pk.—Polk Hall	Z.—Zoology Building

The courses appearing hereafter with numbers 100, 200, and the 300 courses, which are starred, may be taken for undergraduate credit only.

AGRICULTURAL ECONOMICS

Agr. Econ. s260. Agricultural Economics. Five hours a week; three credits. Mr. Forster. 10 M. T. W. T. F. R. 208.

A study of the economics of agricultural production; the nature and characteristics of the factors of production; the laws relating to the combination of the factors; the factors affecting the choice of farm enterprises.

Agr. Econ. s265. Farm Marketing. Five hours a week; three credits. Prerequisite: Economics 102. Mr. Forster. 9 M. T. W. T. F. R. 208.

A study of the economic principles underlying successful marketing of farm products, market organization and control, price-making forces, and critical examination of the present system of marketing farm products.

Agr. Econ. s269. Farm Accounting. Five hours a week; three credits. Mr. Forster. 11 M. T. W. T. F. R. 208.

This course deals with the practical aspects of farm accounting, such as preparation of inventories of farm property, simple financial statements, method of keeping farm records, analysis of farm records, and the interpretation of results obtained from farm business transactions. Attention will also be given to methods of obtaining information on the business aspects of farming.

Agr. Econ. s365. National Economic Policies Affecting Agriculture. Five hours a week; three credits. Mr. Forster. By arrangement. Prerequisite: Econ. 103, Agr. Econ. 260, Agr. Econ. 265.

This course will center its discussion on the present Federal program of Agricultural Relief. Analysis will be made of different farm relief proposals for marketing and credit. Attention will be given to the ways in which vocational teachers, county agents and others may correlate their efforts with the Federal program.

AGRICULTURAL ENGINEERING

Agr. Eng. s130. Farm Equipment. Three credits. Mr. Weaver. By arrangement. Pt. 4.

A study of modern mechanical equipment for the farm.

Agr. Eng. s135. Terracing and Drainage. Three credits. Mr. Weaver. By arrangement. Pt. 4.

A study of the different methods of disposing of surplus water and the prevention of erosion.

Agr. Eng. s155. Farm Engines. Three credits. Mr. Weaver. By arrangement. Pt. 5.

The principle of gas engine operation, its application to single and multiple cylinder engines, and their repair and adjustment.

Agr. Eng. s250. Farm Machinery and Tractors. Three credits. Mr. Weaver. By arrangement. Prerequisite: Agr. Eng. 155. Pt. 4.

A study of the design, construction and operation of modern labor-saving machinery.

ANIMAL HUSBANDRY AND DAIRYING

A. H. s202. Animal Breeding. Three credits. Prerequisite: A. H. 101, 102. By arrangement. Mr. Ruffner.

A study of breeding and improvement of our animals; a first hand study of successful breeding establishments and their problems.

A. H. s203. Advanced Stock Judging. Three credits. Prerequisite: A. H. 101. By arrangement. Mr. Haig. Mr. Ruffner.

A study of market and show-ring requirements in the selection of horses and mules, beef cattle, dairy cattle, sheep and swine. Breed characteristics of these animals are studied in detail.

A. H. s217. Ice Cream Making. Four credits; lectures and laboratories. Prerequisite: A. H. 103. Mr. Clevenger. By arrangement. Pk. 110.

Standardizing of mixing and freezing of ice cream, sherbets, and other frozen products, and the physical principles involved; types of freezers, flavoring materials, fillers and binders; ice cream standards; the theory and practice of artificial refrigeration and its use in the ice cream plant.

A. H. s304. Herd Improvement. Five times a week; three credits. Prerequisite: A. H. 101, 102, 103. Mr. Haig. By arrangement. Pk. 110.

This course is designed for training students as supervisors of cow-testing associations in North Carolina. Rules and requirements for Advanced Registry Testing are studied in detail. Lectures are supplemented with laboratory work, and the student is required to do practical work in keeping feed costs, milk weights, butterfat tests necessary in the efficient management of dairy associations.

A. H. s308. Live Stock Management. Three credits. Prerequisite: A. H. 102. By arrangement. Mr. Ruffner.

A study of successful methods of operating farms devoted chiefly to livestock production.

Courses for Graduates Only

A. H. s402. Research Studies in Animal Husbandry. Three credits. Prerequisite: Eighteen credits in A. H. By arrangement. Staff.

An intensive study of experimental data.

BOTANY

Bot. s101. General Botany. Two lectures, two recitations, eight hours laboratory. Four credits. Mr. Shunk. 8, 2-4, M. T. W. T. Pt. 47.

Nature of the Higher Plant. A course presenting the fundamentals of the structure and function of the typical flowering plant.

Bot. s102. General Botany. Four credits. Mr. Shunk. 8, 2-4 M. T. W. T. Pt. 47.

Survey of the Plant Groups. An introduction to the various major kinds of plants through the study of the life histories of types.

Bot. s203. General Bacteriology. Four recitations, eight hours laboratory. Four credits. Mr. Shunk. Prerequisite: Botany 102 or equivalent. 11, 2-4, M. T. W. T. Pt. 47.

An introduction to the principles of bacteriology. Laboratory work on modern cultural methods of handling and studying bacteria.

Bot. s204. Systematic Botany. Two lectures, eight hours laboratory. Three credits. Mr. Shunk. Prerequisite: Elementary Botany. 9, 2-5, T. Th. Pt. 47.

An introduction to the local flora and the classification of the plants included therein.

Courses for Graduates Only

Botany s401. Pathology of Special Crops. Three credits. Prerequisite: Bot. 201 or 203, 301. Mr. Lehman or Mr. Poole. By arrangement.

A comprehensive study of the etiology, symptoms, and control of specific diseases.

Botany s402. Bacteriology: Special Studies. Three credits. Prerequisite: Bot. 203, 302. Mr. Shunk. By arrangement.

Special work on restricted groups of bacteria such as nitrogen bacteria of the soil, milk organisms and special groups of bacteria in water.

Botany s406. Research in Botany. Three credits. By arrangement. Prerequisite: 30 hours 100-300 courses in Botany.

CHEMISTRY

Chem. s101. General Chemistry. Five hours in classroom and five hours in laboratory each week. Four credits. Equivalent to first term General Chemistry as given in the regular college year. Messrs. Wilson and Satterfield. 8 M. T. W. T. F.; 1-5 T. W. 114.

Composition and properties of air and water. First principles of Chemistry, such as atomic theory, laws of chemical combination, valence, chemical formulas and equations, oxidation, reduction, behavior of gases and solutions. Study of a few typical elements, such as oxygen, hydrogen, carbon and nitrogen, together with their simpler compounds.

Chem. s103. General Chemistry. Five hours in classroom and five hours in laboratory each week. Four credits. Equivalent to second term General Chemistry as given in the regular college year. Messrs. Wilson and Satterfield. 10 M. T. W. T. F.; 1-5 Th. W. 102.

Particular attention given to chlorine, sodium, nitrogen, sulfur, fluorine, bromine, and their compounds. Study of such common substances as salt, lye, soda, carbon disulfide, prussic acid, petroleum, coal tar, acetylene; ammonia and its more interesting uses such as in ice machines; sulfur dioxide in household refrigerators and as a bleaching and germicidal agent; compounds of nitrogen in warfare and agriculture. Introduction to acids, bases, salts, ionization, hydrolysis, equilibrium, the periodic law and the new theories of the structure of the atom.

Chem. s105. General Chemistry. Five hours in classroom and five hours in laboratory each week. Four credits. Equivalent to third term General Chemistry as given in the regular college year. Mr. Wilson. 11 M. T. W. T. F. Laboratory 1-5 T. W. 114.

Chemistry of clays, ceramics, glass, cement, soils, fertilizers, insecticides, lime, hard water alloys, paints, storage batteries, photography, flames and explosions. Compounds and properties of phosphorous, arsenic, bismuth, silicon, boron, potassium, calcium, magnesium, zinc, aluminum, iron, tin, lead, nickel, copper, mercury, silver, gold, platinum and other less common elements. Thermochemistry, colloids and radioactivity.

Chem. s111. Qualitative Analysis. Two hours lecture with four laboratory periods of three hours each, per week. Equivalent to one term of college work. Four hours credit. Prerequisite: General Chemistry. Mr. Wilson. 10 T. Th.; Laboratory to be arranged. W. 102.

A systematic study and separation of the metallic ions and non-metallic ions into their respective groups, their identification and the chemical reactions involved. The last two weeks will be given over to the complete analysis of mixed salts, compounds, and alloys.

Chem. s112. Quantitative Analysis, A. Two lectures and twelve hours laboratory. Equivalent to one term of college work. Four hours credit. Prerequisite: Qualitative Analysis. Mr. Wilson. Arrange. W. 102.

This work will deal with the theory and practice of making up and standardizing acids, bases, di-chromate and permanganate solutions, also the determination of the strength of unknown acids and bases, the analysis for the per cent purity of iron ores, oxalates, sulphates, magnesium phosphate rock, etc.

Chem. s113. Quantitative Analysis. Four credits. Mr. Wilson. Required of sophomores in Chemical Engineering and those majoring in Chemistry. Prerequisite: Chem. 111. By arrangement. W. 217.

A continuation of Chem. 112. Substances of more difficult nature are analyzed, minerals, steel, alloys, limestone, Paris green, etc.

Chem. s141. Practical Organic and Biological Chemistry. Five hours a week.; three credits. Prerequisite: Chem. 101, 103, 105. Mr. Satterfield. 8 M. T. W. T. F.

Hydrocarbons, alcohols, aldehydes, ketones, acids, ethers, esters, amino acids and benzine derivatives; carbohydrates, fats, proteins, and related compounds; vitamins, enzymes, hormones, flavors, and miscellaneous.

Chem. s240. Food Products and Adulterants. Five hours a week; three credits. Prerequisite: Chem. 101, 103, 105 and 141. Mr. Satterfield. 9 M. T. W. T. F.

Food principles, cereals, starches, sugars, fats, milk and mild products, the packing house, food preservation, beverages, spices and condiments; food legislation.

Chem. s341. Vitamins. Five hours a week; three credits. Prerequisite: Chem. 141 or 221. Mr. Satterfield. 12 M. T. W. T. F.

Application of vitamin hypothesis to animal nutrition; history, nomenclature, properties, distribution, effects of deficiencies, and vitamin values.

*If there is a demand for graduate work, these courses will be given.

Chem. s344. Food and Nutrition. Five hours a week; three credits. Prerequisite: Chem. 141 or 221. Mr. Satterfield. 10 M. T. W. T. F.

Carbohydrates, fats, proteins, amino acids, minerals, fiber, vitamins and enzymes; nutritive value of food materials; digestion, food idiosyncrasy; acidosis and alkalosis.

ECONOMICS

Econ. s102. Introduction to Economics. Five hours a week; three credits. Mr. Shulenberg. 8 M. T. W. T. F. Pe. 101.

This course is the regular college one-term course required of all students in Engineering and is designed for those students who do not feel able to devote more than one term to the study of economics, and also for teachers preparing to teach economics in high schools.

This is an elementary course in economics. It treats of the business aspects and economic organization of society. It includes a study of the great fundamental economic laws which apply to all professions and occupations; a study of the production, distribution and value of economic goods, and a study of the institutions, agencies, and ideals which dominate, operate and control the manner, means, and methods of making a living.

Econ. s103. General Economics. Five hours a week; three credits. Mr. Shulenberg. 11 M. T. W. T. F. Pe. 101.

This is the first term of the regular college course in General Economics. An introduction to the general field of economics. A study of economic institutions and the general principles governing the production and distribution of wealth under the existing economic organization.

Sections for F. W. S.

Econ. s112. Accounting for Engineers. Five hours a week; three credits. Mr. Shulenberg. 9 M. T. W. T. F. Pe. 109.

Required of students in the School of Engineering. Not open to students in Business Administration.

A survey of accounting and financial statements and records; their construction, their use and interpretation.

Econ. s201. Accounting I. Five hours a week; three credits. Mr. Shulenberg or Mr. Leager. 9 M. T. W. T. F. Pe. 3.

Required of all sophomores in Business Administration and Industrial Management.

A course in the theory and practice of accounting, covering the essential principles of accounting as applied to the several types of business organizations, giving interpretations of the structure, form, and uses of formal business statements such as Balance Sheets, Statements of Profit and Loss, etc.

Sections for F. W. S.

Econ. s210. Business Organization. Five hours a week; three credits. Prerequisite: Econ. 102 or 103. Mr. Leager. 8 M. T. W. T. F. Pe. 3.

Forms of business enterprises, single enterprises, partnerships, joint-stock company, corporation, and principles of business management.

Econ. s211. Business Law. Five hours a week; three credits. Prerequisite: Econ. 102 or 103. Mr. Shulenberg. 10 M. T. W. T. F. Pe. 109.

Required of seniors in Business Administration, and in Ceramic, Chem-

ical, Civil, Architectural, Electrical, and Mechanical Engineering and teachers of commercial subjects. Elective for other students.

A general survey of the sources of law, fields of law, contracts, agency, sales, law of partnerships and corporation, negotiable instruments, bailments and carriers, personal property, suretyship and guaranty, bankruptcy, crimes in business.

Econ. s217. Advertising. Five hours a week; three credits. Mr. Moen. 7 M. T. W. T. F. Pe. 108.

Principles and practices of advertising and its relation to the distribution and sales program.

***Econ. s325. Investments.** Five hours a week; three credits. Mr. Moen. 8 M. T. W. T. F. Pe. 108.

A description and analysis of the principles and practices of the organized exchanges. Investment securities.

Econ. s330. Principles of Insurance. Five hours a week; three credits. Prerequisite: Econ. 103 or equivalent. Mr. Leager. 11 M. T. W. T. F. Pe. 3.

A general course dealing with the various fields of insurance—life, fire, health, accident, credit, automobile, employees' liability and workman's compensation.

EDUCATION

Courses for Undergraduates

Ed. 101. Introduction to Psychology. Five times a week; 3 credits. Mr. Cruze. 11 M. T. W. T. F.

A study of the structure, function, and laws of human behavior with applications of psychology to everyday life.

Ed. s203a. Educational Psychology. Five hours a week; three credits. Required of students in Education; elective for others. Mr. Cruze. 8 M. T. W. T. F. H. 3.

Original nature and environment are analyzed in this course as to their function in the educational processes. The elementary principles of psychology are illustrated and studied as they relate to the learning process.

Ed. s203b. Educational Psychology. Five hours a week; three credits. Required of students in Education; elective for others. Mr. Cruze. 10 M. T. W. T. F. H. 3.

This part of educational psychology is concerned with the physical and mental development of high school boys and girls. Social development; character development; emotional development and control; religious and moral development; and, mental hygiene are topics given special consideration.

Note to Teachers of Industrial Arts:

Especially for industrial arts teachers, courses will be offered in wood-working, metal work, electrical work, auto-mechanics and mechanical drawing. The instructors will be men of wide experience helpful to teachers of general shop and unit courses.

Ed. s250. Mechanical Drawing for Teachers. Ten hours a week; three credits. Mr. Foster. By arrangement. P. 6.

Lectures and drawing room practice involving problems of junior and senior high school mechanical drawing. Lettering, instrument practice, projections, intersections, developments, tracing, and blue-printing.

*Ed. s303. **Extra-Curricular Activities in the Secondary School.** Five hours a week; three credits. Prerequisite: Junior standing or teaching experience. Mr. Showalter. 10 M. T. W. T. F. Pe. 208.

The home room; pupil participation in government, the assembly; clubs; publications; recreational activities; athletics; honor societies; social organizations; financial support.

Ed. s320. **Vocational Guidance.** Five hours a week; three credits. Mr. Boshart. Prerequisite: Twelve credits in Education. 8 M. T. W. T. F. H. 16.

Treats of the problems of directing pupils in the study of occupations for the purpose of selecting satisfactory life work. It includes studies of the history of occupational guidance and personnel administration, principles and practices in guidance and employment, compulsory school laws, child labor legislation, and forms and records essential for school use.

*Ed. s330. **Visual Instruction.** Five hours a week; three credits. Prerequisite: Twelve credits in Education. Mr. Armstrong. 11 M. T. W. T. F. Pe. 201.

An advanced course in the psychology, methods, and technique of visual instruction; its place and limits, evaluation and expense of various aids, aids available. Practice in the making and use of practical visual aids.

*Ed. s331. **Visual Aids in Social Sciences.** Five hours a week; three credits. Prerequisite: Twelve credits in Education. Mr. Armstrong. 8 M. T. W. T. F. Pe. 201.

A detailed study of visual materials, devices, and procedures applicable to teaching the social sciences, including geography. Emphasis will be given to motivation, facilitating the learning process, and fixation. Various devices will be used by the class.

*Educ. s334. **The Public School Curriculum.** Five hours a week; 3 credits. Prerequisite: Junior standing or teaching experience. Elective for teachers and principals. Mr. Showalter. 12 M. T. W. T. F. Pe. 211.

Analysis of current curriculum offerings; principles on which curriculum reconstruction should be based; study of curriculum investigation.

*Ed. s335. **Public School Administration.** Five hours a week; three credits. This course is intended primarily for superintendents and principals. Prerequisite: Twelve credits in Education. Mr. Highsmith. 9 M. T. W. T. F. Pe. 208.

The following problems will receive consideration:

The powers and duties of the board of education; the powers and duties of the superintendent; the county-wide plan; consolidation of schools; transportation of pupils; school buildings and equipment; operation and maintenance of plant; janitor service; selection, purchase and distribution of supplies; school reports; problems pertaining to the teacher, pupil and home; educational problems of a county school system. Textbooks, lectures, readings and reports.

*Ed. s336. **Problems in Secondary Education.** Five hours a week; three credits. Prerequisite: Twelve credits in Education. Mr. Highsmith. 11 M. T. W. T. R. Pe. 206.

The purpose of this course is to give as practical assistance as possible to those men and women who wish to become or are now serving as high school principals in North Carolina. The following problems will be discussed:

Aims of secondary education; the curriculum (with special reference to

(the North Carolina course of study) standards for high schools; classification of pupils; control of pupils; attendance; guidance of pupils; classroom standards; tests and examinations; marking system; directed study; class schedule making; duties of principals; supervision of instruction; selection of teachers; teaching load; salaries; textbooks, lectures, readings and reports.

***Educ. s337. The Teaching of Geography.** Five hours a week; 3 credits. Prerequisite: Junior standing or teaching experience. Required for a certificate in science. Elective for others. Mr. Showalter. 9 M. T. W. T. F. Pe. 211.

The nature of geography; the place of geography in the curriculum; fundamentals of technique for teaching geography.

***Educ. s345. Curriculum Materials in Physical Science.** Five hours a week. 3 credits. Elective. Mr. Showalter. 10 M. T. W. T. F. Pe. 211.

Survey of physical science with emphasis on recent developments and the generalizations that influence beliefs and attitudes.

Educ. s353. Theory of Industrial Arts. Five hours a week; 3 credits. Prerequisite: Twelve credits in Education. Mr. Boshart. 10 M. T. W. T. F. H. 16.

A study of the value and place of industrial arts in the public school. The correlation of industrial arts with other school subjects; the methods of teaching and supervision, and the study of industries, with the view of selecting suitable projects for class use. Primarily for teachers and supervisors.

***Educ. s354. Practical Arts Problem.** Ten hours a week; 3 credits. Prerequisite: Twelve hours in Education and consent of the instructor. Mr. Boshart and Miss Bell. 2:30-4:30 M. T. W. T. F. H. 15.

A study of problems dealing with the selection and organization of suitable projects in industrial arts and the working out in detail of such as meet the needs of members of the class.

This course presents the craftsman's approach to the materials studied as wood, metal, leather, etc. Simple design construction and shaping of articles such as trays, bowls and decorative pieces; etching of copper and pewter; stamping and tooling of leather; block printing and stenciling.

Intended for teachers of industrial arts and instructors in camps such as C. C. C., Boy Scouts, and Girl Scouts. A small fee for supplies used.

***Educ. s355. Art Studies in Industrial Arts Problems.** Five or ten hours a week. One and one-half or three credits. Prerequisite: Twelve credits in Education and consent of the instructor. Miss Bell. 9-11 M. T. W. T. F. H. 15.

Intended to aid teachers in illustrating their problems through the use of water color, crayons, clay, poster work, etching and designing. A small fee for supplies used.

Ed. s360. Special Problems in Teaching Agriculture. Five hours a week; three credits. Prerequisite: Twelve credits in Education, including Methods of Teaching Agriculture. Messrs. Cook and Armstrong. 9 M. T. W. T. F. Pe. 201.

This course will consider special problems in agricultural teaching and the preparation of teaching plans, involving the use of survey information. Each student will prepare a program of work for a specified community.

***Ed. s364. History of Education.** Five times a week; three credits. Mrs. Wallace. 9 M. T. W. T. F. Pu. 8.

This course will include a brief study of European education and its influence upon the American public school, the early development of the elementary and high schools of America, and the present tendencies of our educational system. The period from 1890 to the present will be given special consideration.

***Education s381. Guidance and Discipline of Students.** Five hours a week; three credits. Prerequisite: 12 credits in Education. Mr. Cook, assisted by Professor Bagby, Dean Bradshaw, Professor Crane, Professor Groves, and other guest lecturers. 9 M. T. W. T. F. Pe. 201.

A study of the needs for moral guidance and discipline; the responsibility of school teachers and administrators for the moral and civic conduct of their students; the nature of the problem, recent development, difficulties, agencies responsible; materials and procedures.

***Ed. s382. Supervision—The Improvement of Instruction.** Five hours a week; three credits. Prerequisite: Eighteen hours in Education. Open to college graduates only. Mr. Highsmith. 10 M. T. W. T. F. Pe. 206.

For principals of high schools, heads of departments, supervisors and teachers.

The problems involved in the supervision of teachers; the planning and organization of supervision; the functions of supervision; rating of principals, supervisors, and teachers; classroom visitation and conferences; the improvement of teachers in the service.

Textbooks, lectures, readings, and reports.

Ed. s412. Occupational Counseling. Five hours a week; three credits. Prerequisite: Ed. 320, 327. Mr. Boshart. 12 M. T. W. T. F. H. 16.

Special attention is given to counseling as it may be applied in the junior and senior high schools, colleges, or placement offices, and the method of conducting individual interviews and group conferences. Information covering occupational material will be organized, evaluated, and applied to specific case studies. For teachers of experience and those familiar with personnel work.

Ed. s416. Problems in Agricultural Teaching. Five hours a week; three credits. Prerequisite: Ed. 203, 307, and at least 12 other credits in Education and Agriculture. Experience in agricultural teaching will be accepted in lieu of Ed. 307. Mr. Cook. By arrangement. Pe. 201.

Investigations, reports, and a critical evaluation of present practices with constructive remedies. The content of the course will depend on the interests and needs of the individual members of the class.

Ed. s421. Research in Special Fields of Education. Staff.

ENGINEERING

C. E. s102. Surveying I. Two sections: one section will run for three weeks, six days a week; the second section will run for six weeks, afternoons only. C. E. Building and field. Three credits. Mr. Mann, Mr. Tucker, Mr. Geile, and Mr. Bramer.

The use, care, and adjustment of surveying instruments; elementary land surveying, traverse lines, leveling, stadia measurements, topographical surveying, plane table surveying; office work in connection with field surveying.

C. E. s200. Mechanics. Six or twelve hours a week; three or six credits.
Mr. P. 102. Required of Engineering juniors. Prerequisite:
Math. 203.

Either the first, second, third, or a combination of two, or all three terms may be taken. First term covers statics, concurrent, non-concurrent and parallel forces, friction, centroids, and moment of inertia. Second term covers kinetics, rectilinear and curvilinear, motion and rotation. Third term covers work, power, and energy.

E. E. s101. Electrical Engineering Fundamentals. Twelve hours a week; six credits. Mr. Fouraker.

This course covers the second and the third terms of the introductory course in Electrical Engineering. Electrical Engineering Problems: fundamental laws of electric, magnetic and dielectric circuits.

M. E. s102. Engineering Drawing. Twelve or twenty-four hours a week; three or six credits. Required of Engineering freshmen. Mr.
8-10 or 8-12 M. T. W. T. F. S. P. 106.

Drawing-board work, covering lettering, orthographic projection, auxiliary projection, isometric projection, cabinet projection, intersection and development, working drawings and blue printing.

M. E. s103. Descriptive Geometry. Twelve hours a week; three credits.
Mr. 8-10 or 10-12 M. T. W. T. F. S. P. 106.

This work covers the representation of geometrical magnitudes, by means of points, lines, planes, and solids, and the solution of problems relating to them.

M. E. s107. Mechanical Drawing. Four, eight, or twelve hours a week; one, two, or three credits. Mr. Kolb. P. 106.

Drawing-board work, covering machine fastenings, pipe fittings, elementary cams, technical sketching, working drawings, tracing and blue printing.

M. E. s108. Metallurgy. Four, eight, or twelve hours a week; two, four, or six credits. Required of Sophomores in Mechanical Engineering.
Prerequisite: Chem. 101. Mr. Kolb. P. 102.

Study of ferrous metals and their alloys; mining, smelting, refining, shaping, and heat-treating.

ENGLISH

Eng. s101. Rhetoric and Composition. Five hours a week; three credits.
Mr. Harrison. 8 M. T. W. T. F. Pu. 104.

Readings and exercises in types of composition; weekly themes; one long term paper; collateral readings; conferences.

Eng. s130. Technical Writing. Five hours a week; three credits. Mr. Harrison. 10 M. T. W. T. F. Pu. 104.

Principles of writing reports and other technical papers; illustrative readings; frequent short papers; a term paper; conferences.

Eng. s202. Advanced English Grammar. Five hours a week; three credits. Mr. Ladu. 9 M. T. W. T. F. Pu. 105.

The science of grammar and its functional usage; forms, inflections, and idioms.

Eng. s221. Survey of American Literature. Five hours a week; three credits. Mr. Ladu. 10 M. T. W. T. F. Pu. 105.

A study of the masterpieces and outstanding types of American literature in their historical settings, together with a critical examination of the development of American thought in connection with its European background.

***Eng. s320. The Short Story.** Five hours a week; three credits. Mr. Harrison. 11 M. T. W. T. F. Pu. 104.

Development, structure, types, and style of the present-day short story; writing narratives of fact and of fiction; conferences.

Eng. s337. Contemporary American Literature. Five hours a week; three credits. Mr. Ladu. 11 M. T. W. T. F. Pu. 105.

A study of the leading writers of the present century, and an attempt to interpret their works against the social background of the period.

FIELD CROPS

F. C. s1. Cotton Classing. Twenty hours a week for six weeks. No college credit. Mr. Darst, Mr. Cotner. 9-1 M. T. W. T. F. Pt. 45.

The Summer School of Cotton Classing offers an intensive course in the grading and stapling of cotton.

The course will consist of lectures and daily practice in grading and stapling cotton samples according to the "Universal Cotton Standards."

The course will be given each day, with the exception of Saturday, for four hours a day.

The first period of each day will be devoted to lectures and discussions, and the remaining time will be used in the actual practice of grading and stapling cotton.

All the instruction in classing will be done by men holding a Federal Cotton Classing license.

The Cotton Classing course is designed for a special group, and does not carry collegiate credit. There is a flat charge of \$27.50 for the whole course in Cotton Classing. Persons registered for fifty per cent or less of the course will be charged \$15.00. All fees are to be paid on or before registration.

A Cotton Classing certificate will be issued by the College to those satisfactorily completing the six weeks course.

The school has been serving the State and neighboring states for fourteen years. The school has international recognition, as men from the following countries have taken the course: South America, India, China, South Africa, Belgium and Germany.

Persons expecting to attend this course should notify Dr. J. B. Cotner, State College Station, Raleigh, N. C.

F. C. s201. Cereal Crops. Prerequisite: General Field Crops. Five hours a week; three credits. Mr. Darst, Mr. Cotner. 11 M. W. F.; 11-1 T. Th. Pt. 26.

Lectures and recitations in history, production, cultivation, improvement, harvesting, storage, and marketing. Laboratory consists of structural studies, seed judging, variety identification, and commercial grading. Special problems in cereal production.

F. C. s210. Cotton Production, or s215. Tobacco Production. Five hours a week; three credits. Mr. Cotner. 8 M. T. W. T. F. Pt. 45.

Lectures and recitations on history, production, adaptation, types and varieties, including cultivation, harvesting, grading, and marketing, will be

given. Laboratory consists of variety studies, the classing of cotton, and the grading of tobacco.

F. C. s225. Cotton Classing II. Three credits. Mr. Cotner. 9-11 or 11-1.

Required of sophomores in Textile Manufacturing, Chemistry and Dyeing, and Designing.

A study of the universal standards of American upland cotton for grade and staple. Factors that determine grade and their relative value. Practice will consist of classing and stapling three to five thousand samples of cotton.

F. C. s302. Advanced Cotton Classing. Three credits. Mr. Cotner. 9-11 or 11-1. Prerequisite: F. C. 101 or 105, 225, or 220.

For men who expect to become specialists in cotton classing. This course will prepare men to take the U. S. Civil Service examination for cotton classing.

F. C. s330. Advanced Seed Judging and Grading. Prerequisite: Cereals. Five hours a week; three credits. Mr. Darst, Mr. Cotner. 12 M. W. F. 2-4 T. Th. Pt. 26.

Lectures and practice in planning, arranging and judging field crops exhibits. Study of the Federal grain and hay standards. A course planned to develop experts in the judging of field crop seeds and in the grading of grain and hays. A course designed for agricultural extension workers and vocational teachers.

F. C. s351. Advanced Study of Crops Research. Undergraduate credits, 3-9; Graduate credits, 2-6. Elective for graduates and advanced undergraduates. Mr. Darst, Mr. Cotner. By arrangement. Pt. 26.

A field study of the research work and demonstration work in crops. This course will be based directly upon experimental work in progress.

The crop or crops for study will be agreed upon by the class.

F. C. s401. Crop Research. Three credits. Prerequisite: Eighteen credits in F. C. By arrangement. Mr. Darst, Mr. Cotner.

A study of special problems and methods of investigation. A student may select a problem in any phase of crop production.

F. C. s415. Plant Breeding Research. Three credits. Prerequisite: F. C. 345. By arrangement. Mr. Cotner.

Inheritance problems of the plants. Available during any season appropriate to the study of the particular crop.

GEOLOGY AND PHYSICAL GEOGRAPHY

Geol. s101. Earth History. Five hours a week; three credits. Mr. Stuckey. 9 M. T. W. T. F. Pr.

Open to both college students and teachers who are interested in a better understanding of the world about them.

An introductory course in general geology dealing with the changes which have taken place in the earth and the physical and life processes which have brought about these changes. The first half of the course deals with the processes of physical and dynamical forces while the second half deals with the historical development of the earth as it has been affected by those forces and by life processes.

Geol. s105. Physical Geography. Three lectures; four hours laboratory and field work; three credits. Equivalent to the regular course in physical geography given in the third term of the college year. Mr. Stuckey. 10 M. T. W. T. F. Pr.

The course is intended to give those interested in general science and in teaching a better appreciation of physical geography. It will include an account of the earth as a planet; the atmosphere; the development of winds and rain; changes in the earth's crust; and the development of relief features and physiographic provinces.

The work of running water, ground water, wind, snow and ice, and forces within the earth as they affect the relief features will be taken up in some detail.

The course will also include a brief consideration of the physical geography of North Carolina.

Geol. s120. Physical Geology. Three lectures; four hours laboratory and field work; three credits. Mr. Stuckey. 8 M. W. F. Laboratory by arrangement. Pr.

Physical Geology as related to forces acting on and in the earth, and materials of the earth's crust.

Geol. s291. Geology of North Carolina. Three lectures; four hours laboratory; three credits. Mr. Stuckey. 12 M. W. F. Laboratory by arrangement. Pr.

Elective for students in the Schools of Engineering and Science and Business who have had Geol. 101 or 120.

Also open to teachers who are interested in the geology of North Carolina and who may be interested in helping students to collect and assemble groups of the common rocks and minerals from different sections of the State.

The course will cover the physical geography, general geology, common rocks and minerals, and mine and quarry products of the State.

HISTORY

Hist. s101a. American Economic History. Five hours a week; three credits. Mr. Barnhardt. 8 M. T. W. T. F. Pu. 6.

Discovery, colonization, economic background of the Revolution, government foundations, wars, presidential administrations, public lands, public finance, agriculture and industry.

Hist. s101c. Commercial Geography (Commercial and Industrial). Five hours a week; three credits. Mr. Barnhardt. 11 M. T. W. T. F. Pu. 6.

This course is designed to prepare teachers of geography in the high schools as provided for in the plan of High School Reorganization as well as for students in the School of Science and Business. Geographical conditions affecting industries, production and commerce of the world; development and relations of commercial areas to location and availability of resources; markets and transportation routes.

Hist. s201b. Modern European History. Five hours a week; three credits. Mr. 10 M. T. W. T. F. Pu. 6.

The political and social history of Europe from 1789 to 1870. A survey of the French Revolution and Napoleon; the era of Metternich; democratic reforms and revolution; the Industrial Revolution; and the growth of nationalism in 1870.

Hist. s201c. Contemporary Europe. Five hours a week; three credits. Mr. Barnhardt. 9 M. T. W. T. F. Pu. 6.

This course deals with the economic, social, and political developments in Europe from 1870 to the present time. Special emphasis is laid upon the causes of the World War. The war is studied in outline and attention is given to post-war conditions.

Hist. s209. American Government. Five hours a week; three credits. Mr. Lefler. 10 M. T. W. T. F. Pu. 6.

This course gives a survey of the historical development, the constitution, the organization, powers, and the actual operations of our national government. Special emphasis is given to present day conditions and movements in our government and political life.

***Hist. s302. Recent U. S. History 1865-1914.** Five hours a week; three credits. Prerequisite: History 101. Mr. Lefler. 12 M. T. W. T. F. Pu. 5.

Reconstruction following the Civil War, development of West and South, transportation, rise of big business and organized labor, political parties, movements for reform, the free silver movement, war with Spain, American expansion, rise of the Progressive Party; the World War.

***Hist. s303. History of North Carolina.** Five hours a week; three credits. Prerequisite: History 101. Mr. Lefler. 11 M. T. W. T. F. Pu. 6.

The purpose of this course is to give the teachers of North Carolina and others a general view of the political, economic, and social development of North Carolina from colonial beginnings to the present day. A brief survey will be made of the settlement of North Carolina, the various racial groups which colonized, agriculture, industry, and commerce in the colonial era, and the relations of the province to England. A more detailed study will be made of North Carolina between the Revolution and the Civil War, emphasis being given to North Carolina and states' rights, social conditions, slavery and the free Negro, agriculture and industry, and the beginnings of public school education. Particular emphasis will be placed on the recent development of the State, the rise of textile, tobacco, and other industries, the development of agriculture, public schools and higher education, good roads, and other factors in recent North Carolina progress.

Hist. s322. Contemporary American History, 1914-1935. Five hours a week; three credits. Mr. Lefler. 8 M. T. W. T. F. Pu. 5.

America in the World War, post war problems, political, social, and economic affairs to the present day, including study of the New Deal.

HORTICULTURE

Hort. s102. Plant Propagation and Nursery Practice. Three credits. Mr. Randall. By arrangement.

Study of methods and practice in seedage, cuttage, separation and division, budding and grafting. Cultural principles and practices in growing nursery stock.

Hort. s105. Small Fruit Culture. Three credits. Mr. Gardner. By arrangement.

A course in the culture and production of small fruits including strawberries, dewberries, blackberries, blueberries, raspberries, currants and grapes.

Hort. s209. Vegetable Production. Three credits. Mr. Randall. By arrangement. Pk. 308.

Location, soil preparation, fertilization, irrigation, and general culture applicable to commercial vegetable production.

Hort. s228. Home Floriculture. Three credits. Mr. Randall. By arrangement. Pk. 308.

Principles and methods of growing garden flowers and house plants, including varieties and their adaptability.

There will be the equivalent of two lectures and one two-hour laboratory for each of the above courses.

LANDSCAPE ARCHITECTURE

L. A. s203. Plant Materials. Two credits. Mr. Weaver. By arrangement.

Ornamental plants, their characteristics of use in planting design for home, school and church grounds, and farmstead landscapes.

L. A. s217. Annual and Herbaceous Plants. Two credits. Mr. Weaver. By arrangement.

Herbaceous and annual plants, their height, habits of growth, texture, season, color and other characteristics determining use in planting design.

MATHEMATICS

Math. s100-a. Mathematical Analysis. Five hours a week; three credits. Prerequisite: Algebra to quadratics and Plane Geometry. Mr. Fisher. 11-12 M. T. W. T. F. Page 209.

Review of elementary topics such as factoring, fractions, simple equations, exponents and radicals. Topics then taken up are: quadratic equations, solution of higher degree equations, simultaneous quadratic equations, logarithms, the binomial theorem and the elementary theory of probability.

Math. s100-b. Mathematical Analysis. Five hours a week, three credits. Mr. Fisher. 11-12 M. T. W. T. F. Page 209.

The study of trigonometric functions with their applications to the solution of the right and oblique triangles, with numerous problems. Also a brief study of trigonometric equations and identities, and inverse functions.

Math. s100-c. Mathematical Analysis. Five hours a week, three credits. Mr. Williams. 9-10 M. T. W. T. F. Page 101B.

Simple and compound interest, annuities, sinking funds and amortization and valuation of bonds, and other applications.

Math. s101. Algebra. Twelve hours a week, six credits. Mr. Mock. 8-10 M. T. W. T. F. S. Page 203.

Progressions, binomial theorem, undetermined coefficients, logarithms, compound interest and annuities, permutations and computations, the general theory of equations, and the solution of higher equations.

Math. s102. Trigonometry. Twelve hours a week, six credits. Mr. Mock. 8-10 M. T. W. T. F. S. Page 203.

Definitions of trigonometric functions, derivations of formulae, solution of plane and spherical triangles, and the solution of many practical problems.

Math. s103. Analytical Geometry. Twelve hours, six credits. Prerequisite: Mathematics 101 and 102. Mr. Mumford. 11-1 M. T. W. T. F. S. Page 101A.

Locii of equations, the straight line, circle, parabola, ellipse, hyperbole, and the general equation of the second degree.

Math. s201. Differential Calculus. Ten hours a week, five credits. Prerequisite: Mathematics 103. Mr. Williams. 11-1 M. T. W. T. F. Page 101B.

An elementary course on the fundamental principles of the Calculus, including the development of the formulae for differentiation with their application to the problems in rates, maxima and minima, etc.

Math. s202. Integral Calculus I. Ten hours a week, five credits. Prerequisite: Mathematics 201. Mr. Williams. 11-1 M. T. W. T. F. Page 101B.

Methods of integration, the study of the definite integral with applications to problems in areas, volumes, surfaces, and lengths of arcs.

Math. s203. Integral Calculus II. Ten hours a week, five credits. Prerequisite: Mathematics 202. Mr. Fisher. M. T. W. T. F. Page 209.

Centroids, radii of gyration and moments of inertia, problems in work and liquid pressure, double and triple integrals, infinite series, hyperbolic functions, and differential equations.

***Math. s341. The Teaching of High School Mathematics.** Ten hours a week; five credits. Prerequisite: Ed. 101, 203, 212, 213 and 20 credits in Mathematics. Mr. Mumford. 11-1 M. T. W. T. F. P. 101B.

A comprehensive view of the materials of high school mathematics will be accompanied by a discussion of the selection and use of textbooks and supplementary helps. Practice will be given in the construction and use of written examinations, and the comparative merits of standard tests will be considered. Attention will be given to adapting both the content and the methods of procedure to the needs of various groups.

MODERN LANGUAGES

German

M. L. s108. Elementary German Prose. Five hours a week; three credits. Mr. Hinkle. 10 M. T. W. T. F. Pe. 212.

This course is intended for students who have had little or no previous training in German as well as those who may wish to review the elements of German grammar and pronunciation. It consists of reading and translation with the elements of grammar. Practice in the pronunciation and understanding of German is given by means of dictation and oral practice.

M. L. s109. Introductory Scientific German. Five hours a week; three credits. Mr. Hinkle. 10 M. T. W. T. F. Pe. 212.

This is a reading translation course in scientific German literature. A great deal of attention is given to the study and analysis of German scientific constructions, and a basis is laid for the development of a scientific vocabulary. Open to students who have had two years of high school German or one year of college German.

¹NOTE.—Courses in this department may be taken for double credit by arrangement with the teacher concerned and the approval of the Dean of Administration.

Other regular college credit courses may be substituted for the ones here offered in case of sufficient demand.

M. L. s210. Elements of Language. Five hours a week; three credits.
Mr Hinkle. 11 M. T. W. T. F. Pe. 212.

The object of this course is to acquaint the student with the various phases of linguistic growth for the purpose of providing a basis for the intelligent study and teaching of languages. Such problems as the origin of language, linguistic change, grammatical categories, dialects, standard language, word order, inflection, etymology, and other linguistic processes are studied. The discussions are adapted to the needs of language teachers as well as language students.

French

M. L. s107. Elementary French Prose. Five hours a week; three credits.
Mr. Hinkle. 9 M. T. W. T. F. Pe. 212.

This course consists of the elements of grammar with readings and translations based upon selections from representative modern French authors. Rapid reading and sight translation are stressed.

M. L. s211. Conversational French. Five hours a week; three credits.
Mr. 8 M. T. W. T. F. Pe. 212.

This course is essentially a practice course in French reading and pronunciation. Much attention is given to the use of idiomatic construction and to training the ear to understand the spoken language. Its aim is to acquaint the student with the ordinary uses of the language.

Spanish

M. L. s111. Elementary Spanish. Five hours a week. Three credits.
Mr. 12 M. T. W. T. F. Pe. 211.

This course is intended for students who have had little or no previous training in Spanish. It consists of reading and translation with the elements of grammar. Practice in the pronunciation and the understanding of Spanish is given by means of dictation and oral practice.

PHYSICAL EDUCATION

P. E. s111. Games and Organized Play. Three hours theory, two hour practice; two credits. Mr. Miller. By arrangement. Gym.

Games suitable for the playground, elementary and secondary schools, ranging from the simplest primary school games to organized games such as volleyball, soccer and tag football, playground ball and dancing. The organization and administration of playgrounds will be stressed. Mr. Miller will teach the men's section and Miss Crow will teach the women's section.

P. E. s114. Football-Theory and Practice. Five hours theory, three hour practice; three credits. Mr. Miller. By arrangement. Gym.

This course will cover the rules, equipment, schedule making, individual position play, individual technique, comparisons of offensive and defensive systems, training and conditioning.

P. E. s115. Basketball-Theory and Practice. Five hours theory, three hour practice; three credits. Mr. Miller. By arrangement. Gym.

The content of this course is similar to PE s114.

NOTE.—P. E. s101 and P. E. s102, Fundamental Activities and Sports Activities, the required courses for freshmen and sophomores, will be given if there is demand. Regular students who are behind in their requirement may make it up.

PHYSICS

Physics s110. General Physics and Physics for Textile Students. Four or eight credits. Five hours class work, one 2½ hours laboratory each week for four credits. Double this for eight credits. Staff. 9 M. T. W. T. F. 2-4 Tu.; 9-11 M. T. W. T. F.; 2-4 T. T. P. & E. 113.

A course covering the whole field in condensed form. It is especially designed for high school teachers, containing method as well as subject matter. The materials discussed give a broad background of additional subject matter with which to supplement a like course given in high school. It is given in halves taken simultaneously. At nine, force and machines, heat and weather, sound and the physics of music are given. At ten, light and the general field of electricity and the electrical nature of matter are given. Either half may be taken and four college credits earned, substituting for the corresponding term of Physics 101. Two afternoons of laboratory accompany each half.

Physics s104. Five or ten credits. Mr. Staff. 8 M. T. W. T. F.; 2-4 M. W.; 8-10 M. T. W. T. F.; 2-4 M. T. W. T. F. P. & E. 212.

An advanced treatment of General Physics. First, second, or third terms work may be taken or any two terms taken simultaneously.

Physics s107. Descriptive Astronomy. Five hours a week; three credits. Mr. Heck. 12 M. T. W. T. F. P. & E. 212.

A descriptive course covering the most interesting elements in the study of the sun and planets and the stars. The modern interpretation of the universe as a whole given in this course makes it valuable as a background to a student or teacher of any subject. Observation periods, using the telescope on top of the physics building, will be substituted at times for class lectures.

***Physics s312. Photography.** Three credits. Four hours class work and two laboratory periods each week. Mr. Meares. 11 M. T. W. T. Laboratory by arrangement.

A general course in photography covering cameras and lenses; principles of exposure, development and printing; lantern slides, micro-photography, projection printing and color photography.

Physics s411. Research.

Graduate courses in physics will be given if there is sufficient demand.

POULTRY SCIENCE

Poul. s303. Poultry Nutrition. Three credits. Mr. Williams or Mr. Dearstyne. By arrangement. R. 208.

This course covers the fundamentals of poultry feeding, physiology of digestion, utilization of home grown feeds, finishing of capons and broilers.

Poul. s305. Poultry Diseases. Three credits. Mr. Gauger or Mr. Dearstyne. By arrangement. R. 208.

A study of the diseases of poultry and of parasitic infestations; sanitation in relation to disease prevention; special stress on autopsy work.

Poul. s311. Advanced Poultry Production. Three credits. Mr. Dearstyne, Mr. Williams. By arrangement.

An advanced course in Poultry Production, including a study of Breeding, Nutrition and Common Diseases.

SOCIOLOGY

Soc. s102. Introductory Sociology. Five hours a week; three credits.
Mr. Winston. 11 M. T. W. T. F. Pu. 8.

This course offers an inductive introduction to the field of sociology by taking up a number of social problems which are already somewhat familiar to every one. These problems confront every community and our general citizenry. The outstanding problems to be considered are: poverty, crime, divorce, immigration, population and race problems. This course, therefore, is a natural introduction to the sociology courses, which deal more directly with social theory.

Soc. s103. General Sociology. (1st term.) Five hours a week; three credits. Mr. Winston. 10 M. T. W. T. F. Pe. 108.

The course deals first with the basic principles of sociology, then analyzes society and its influence on human behavior.

***Soc. s301. Social Pathology.** Five hours a week; three credits. Prerequisite: Soc. 103. Mr. Winston. 9 M. T. W. T. F. Pe. 108.

The course gives primary attention to the problems of adjustment resulting from the complexities of modern life. In the Summer Session, it is particularly adapted to the behavior problems of children which teachers face in their work.

***Soc. s306. The American Family.** Five hours a week; three credits. Prerequisite: Soc. 103 and three additional term credits in Sociology. Mr. Winston. 8 M. T. W. T. F. Pe. 108.

A study of family relationships, of the relationship between husband and wife, parents and children, with particular emphasis on the development of personality. The effect of present-day social changes upon the family and the changes in family life as a result will be studied. Discussion of various efforts to stabilize the family. The part habits play in successful and non-successful marriages will also be discussed.

SOILS

Soils s220a. Soil Geography of the United States. Five periods a week; three credits. Mr. Clevenger. 8 M. T. W. T. F. Pt. 16.

A course dealing with the characteristics and distribution of the soil groups of the United States and their influences on the agricultural, grazing and forest industries of the country.

Soils s310. Fertilizers. Four hours of class and one laboratory period a week; three credits. Mr. Clevenger. 10 M. T. W. T. Laboratory to be arranged. Pt. 16.

A study of the sources, characteristics and utilization of fertilizers.

Soils s315. Soils of North Carolina. Four hours of class, one laboratory period a week; three credits. Mr. Clevenger. 11 M. T. W. T. Laboratory to be arranged.

A study of the origin, characteristics, distribution and utilization of North Carolina soil types.

Soils s319. Fertilizer Experimentation. Three credits. Mr. Lutz. By arrangement.

A study of methods of determining the fertilizer needs of different crops on different soil types.

Soils s430. Soil Research. Two to five credits. Mr. Clevenger and Mr. Lutz. By arrangement.

TEXTILES

Tex. s102. Yarn Manufacture I. Three credits. Mr. Hilton. By arrangement. Textile Building.

Mixing of cotton, description and setting of openers, pickers, and cards. Production, speed and draft calculations.

Tex. s103. Yarn Manufacture Laboratory I. One or two credits. Mr. Hilton. By arrangement. Textile Building.

Operation and fixing of machines. Grinding and setting cards.

Tex. s104. Knitting I. Three credits. Mr. Lewis. By arrangement. Textile Building.

Selection and preparation of knitting yarns, knitting mechanisms, plain and rib knitting machines, circular ribbers, and circular automatic machines.

Tex. s105. Knitting Laboratory I. One, two, or three credits. Mr. Lewis. By arrangement. Textile Building.

Operation of machines, practical experiments, hosiery analysis, topping, transferring and looping.

Tex. s106. Fabric Structure and Analysis. Two, four, or six credits. Mr. Lewis. By arrangement. Textile Building.

Systems of numbering woolen, worsted, silk, linen, rayon, and cotton yarn. Plain, twill, and sateen weaves. Ornamentation of plain weaves; wave designs; pointed twills; diamond effects; plain and fancy basket weaves; warp and filling rib weaves.

Analyzing plain, twill, sateen, and other fabrics made from simple weaves, ascertaining the number of ends and picks per inch in sample. Fabric analysis calculations.

Tex. s107. Power Weaving. Two credits. Mr. Nelson. By arrangement. Textile Building.

Construction of auxiliary motions on plain looms. Cams and their construction. Drop-box loom construction. Methods of pattern chain building. Construction and value of pattern multipliers. Timing of drop-box motion, and other studies.

Tex. s108. Power Weaving Laboratory. One or two credits. Mr. Hart. By arrangement. Textile Building.

Operating and fixing of plain, automatic and drop-box looms. Pattern chain building for drop-box looms.

Tex. s115. Textiles for Teachers. Five hours a week; three credits. Mr. Nelson. 8 M. T. W. T. F. Textile Building.

This course is designed to give a fundamental knowledge of fabrics. It will include a study of various fabrics and their selection and adaptability to different uses. Various methods of distinguishing fabrics made from different materials such as cotton and rayon, cotton and wool, wool and silk, and other combination of yarns will be given and analysis made of the fabrics. In addition, a general survey of the various processes through which cotton passes in its transition from the raw material to the finished product will be studied.

Tex. s201. Yarn Manufacture II. Three credits. Mr. Hilton. By arrangement. Textile Building.

Construction of draw frames; sliver lapper; ribbon lapper, comber; mechanical and electrical stop motions, description and setting of the different parts; weighting of rolls; types of roll covering; care of machines; fly frame builder and differential motions.

Tex. s202. Yarn Manufacture Laboratory II. One, two, or three credits. Mr. Hilton. By arrangement. Textile Building.

Operation and fixing of draw frames; sliver lappers; ribbon lapper; comber and fly frames. Changing of hank roving and the setting of rolls and speeder motions.

Tex. s205. Fabric Design and Analysis I. Three or six credits. Mr. Hart. By arrangement. Textile Building.

Construction of fancy weaves, such as broken twills, curved twills, entwining twills, granite weaves. Imitation leno; honeycomb weaves; fabrics backed with warp or filling; fabrics ornamented with extra warp or filling; combining weaves together to produce new patterns.

Analyzing samples of fancy fabrics for design, drawing in draft, reed, and chain plan. Calculating particulars to reproduce fabric from data obtained from sample.

Tex. s207. Dobby Weaving. Three credits. Mr. Nelson. By arrangement. Textile Building.

Methods of drawing in and starting up cotton and rayon warps. Setting of harness shafts. Selection of springs or spring jacks. Construction and methods of fixing single and double index dobbies. Methods of pattern-chain building.

Tex. s208 or s209. Dobby Weaving Laboratory I or II. One, two, or three, or six credits. Mr. Hart. By arrangement. Textile Building.

Preparation of warps for weaving cotton and rayon fabrics on dobbie looms; starting up warps in looms; fixing single and double index dobbies; pattern chain building; operation of dobbie looms.

Tex. s301. Yarn Manufacture IV. Three credits. Mr. Hilton. By arrangement. Textile Building.

Spinning; spooling; twisting. Description and setting of different parts. Builder of motions for warp and filling. Bobbin holders, thread guides, traverse motions. Ply yarns. Calculations for twist, speed and production.

Tex. s309. Cotton and Rayon Fancy Design I. Three, six, or nine credits. Mr. Nelson. By arrangement. Textile Building.

Designing fancy and jacquard fabrics. These fabrics include tablecloths, figured double plain; matelasse, velvet, corduroy. Leno weaves with one, two, or more sets of dous. Combinations of plain and fancy weaves with leno. Methods of obtaining leno patterns. Methods of making original designs by combinations of color, weave, and sketches. Designs for table napkins, table covers, dress goods, draperies.

ZOOLOGY

Zool. s101. General Zoology. Five recitations, four hours laboratory. Four credits. Mr. Mitchell. 9 M. T. W. T. F. Laboratory arranged. Z. 7.

A study of the structures and functions of the vertebrates with special reference to man and the rat.

Zool. s102. General Zoology. Five recitations, four hours laboratory. Four credits. Mr. Bostian. 10 M. T. W. T. F. Laboratory arranged. Z. 8.

A review of the groups of animals with special reference to those of economic importance.

Zool. s103. Human Physiology. Five recitations, four hours laboratory. Three credits. Mr. Bostian. 8 M. W. F. Laboratory arranged. Z. 8.

A study of the functions of the human body, designed especially for teachers.

Zool. s204. Economic Entomology. Five recitations, four hours laboratory. Four credits. Mr. Mitchell. 8 M. W. F. Laboratory arranged. Z. 7.

A general study of the insects, including their economic importance, with emphasis upon control of the more important local species.

Zool. s220. Animal Nature Study. Five recitations, four hours laboratory. Three credits. Mr. Metcalf. 9 M. W. F. Laboratory arranged. Z. 201.

A study of the common birds, animals and insects with special reference to presenting this material for grade school teachers.

Courses for Graduates Only

Zool. s401. Systematic Entomology. 3 credits. Mr. Metcalf, Mr. Mitchell. By arrangement. Prerequisite: Zool. 307 or equivalent.

A thorough discussion of codes of nomenclature, methods of writing descriptions, constructing keys, determining priority, selecting and preserving types, and making bibliographies and indexes. The student may select some special group of insects for detailed study.

Zool. s403. Research in Zoology. Three credits. Mr. Metcalf, Mr. Mitchell, Mr. Bostian. By arrangement. Prerequisite: Eighteen term credits in Zoology.

The student will be assigned a problem in development morphology, ecology, physiology, genetics or taxonomy.

**COURSES OFFERED AT THE UNIVERSITY OF NORTH
CAROLINA, CHAPEL HILL, FOR THE SECOND
SESSION, JULY 25-AUGUST 31**

In addition to the first term of the Summer Session at Chapel Hill, Greensboro and Raleigh, a second term of six weeks, from July 25 to August 31, will be provided at Chapel Hill, with regular work in Botany, Chemistry, Economics, Commerce, Education, English, Geology, German, History, Government, Latin, Library Science, Mathematics, Music, Physics, Psychology, Public Administration, French, Spanish, Rural Social Economics, and Sociology. Graduate work, both academic and professional, will be offered in all of these departments. The second session at Chapel Hill has been so arranged that students in the first session at the Woman's College in Greensboro and at State College in Raleigh may continue their work for another six weeks without interruption or loss.

Information regarding the second term of the Summer Session at Chapel Hill will be furnished by Dean R. B. House, Chapel Hill. Students desiring to take graduate work during the second term there should write to Dean W. W. Pierson, Chapel Hill.