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Announcement of Courses



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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INDEX

Agriculture	16, 17, 21, 23, 30, 35
Agricultural Education	20-24
Basic Academic Courses.....	16-37
College Preparatory Courses.....	13-14
Cotton Classing	27-28
Education	20-21
Engineering	24-25
Forestry	14
General Information	9-12
Industrial Arts	22-23
Short Course for Janitors and Firemen.....	12
Short Course for Waterworks Operators.....	12
Short Course for Gas Plant Engineers and Operators.....	13
Vocational Agriculture for Teachers.....	15
Vocational Guidance	21

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SUMMER SESSION, 1937

In accordance with the plans that are being carried out in the consolidation of the Greater University of North Carolina, the summer sessions 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. The summer terms are conducted as an integral part of the regular college year under the guidance of the regular administrative staffs.

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-fourth Summer Session of the North Carolina State College of Agriculture and Engineering of the University of North Carolina begins Monday, June 14th, and closes Friday, July 23rd.

COLLEGE CREDIT

Beginning with 1924-1925, the regular session of the 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 students taking more than one ten-period course.

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 upon approval. In no case will a student be allowed more than twelve credits of work.

AUDITORS

Students not carrying a full load, and others who receive permission, may audit classes by paying a \$5.00 fee for each class attended. This does not permit the individual to receive credit for the course, and he is not permitted to take part in class discussions or receive any individual assistance from the teacher.

ADMISSION OF WOMEN

A recent ruling of the Board of Trustees does not allow this institution to accept women students until they have completed a minimum of forty-eight semester hours at some other college. It will therefore be necessary for women students to present credentials on or before registration day indicating they have the required amount of advance standing.

DEGREES IN EDUCATION

No degrees in Education will be awarded after July, 1938, except in Agricultural Education and Industrial Arts Education. Teachers planning to receive their degrees at this institution in other fields of Education should arrange to complete their work by that time.

TEACHING CERTIFICATES

We have received the following information from the Division of Certification of the State Department of Public Instruction which will be of interest to all teachers attending summer school to raise their certificates:

"As of July 1, 1939, and thereafter, the Class A Certificate built up from a lower grade certificate will be based upon a satisfactory completion of the requirements for a degree from a standard college, along with, or in addition to, the specific certificate requirements. It is suggested that those teachers in service who may not reasonably be expected to qualify for the Class A Certificate prior to July 1, 1939, arrange their program of studies in cooperation with the institution from which they would like to obtain the degree."

The State Department of Public Instruction is anxious to administer in a most effective way all certificate problems growing out of summer school attendance. The enterprise, however, is a cooperative one, involving the individual teacher, the institution conducting the summer school, and the State Department of Public Instruction. Looking toward a most satisfactory administration of these problems, the following general observations are made:

1. All teachers should fill out the back of the summer school card, giving the exact name which the certificate carries, the kind of certificate held, the serial number, et cetera. A teacher's registration should not be considered complete without this information.
2. Teachers who are expecting a change in their certificate for 1937-38 as a result of their summer school work, should wait for four weeks before making any inquiry of the State Department of Public Instruction. Last year about 11,000 summer school records were handled. It should be reasonable to assume a month's time would be required for handling these records and issuing the certificates growing therefrom.
3. Teachers who are expecting their certificates to be raised as a result of summer school attendance should not send their old certificates to the State Department of Public Instruction. This is not necessary for the issuance of the new certificate.
4. Teachers should not send to the State Department of Public Instruction their personal reports of summer school work. The report must come direct from the institution, and will be sent by the institution if the teacher has properly registered.
5. Institutions should send the reports to the State Department of Public Instruction as promptly as possible after the close of the summer school. At present there is considerable variation among the institutions in their practice with reference to this point.

FEEES 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 (estimate).....	30.00

College Fees

Registration Fee	\$ 3.00
Course Fee (for each quarter hour of credit) ----	3.00
Medical Fee	1.00
Laboratory Fee for students taking surveying....	2.00

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

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

There will be a late registration fee of \$2.50 for all students who do not complete their Registration on Monday, June 14th.

BOARD

The College maintains an excellent cafeteria where charges are reasonable. Students can purchase meal tickets at a reduced rate, so that board for the six-weeks period will be approximately \$30.00.

ROOMS

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.

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

REGISTRATION

All registrations will be conducted in Frank Thompson Gymnasium beginning at 9 a.m. on June 14th. Students are expected to report in person on Monday, June 14th, so that they may begin class work on the morning of Tuesday, June 15th, 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. The final date for completing registration is 5:00 p.m. Wednesday, June 16th.

DIPLOMAS

Students expecting to receive a degree at the end of the summer session should come to the Office of Registration early in the session, to be sure they are meeting all the requirements for graduation.

LIBRARY FACILITIES

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.

SOCIAL AND RECREATIONAL FACILITIES

A reception for students and faculty, followed by other social and recreational events, serve to foster a congenial spirit in the student body. Weekly assembly periods with varied and interesting programs; voluntary student musical organizations; a weekly open forum for the discussion of timely subjects; the social center at the Y. M. C. A.; weekly dances; and

supervised recreation, consisting of swimming, tennis, baseball, volleyball, basketball, and handball, provide a wide range of recreational activities.

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.

SPECIAL SHORT COURSES

During the summer the College offers several short courses. These courses are designed to be of practical value to people already employed in particular fields of work.

The total cost of any of these short courses, including cost of registration and room rent, will not exceed \$3.00. Board is not furnished, but can be secured at the College Cafeteria.

For the summer of 1937 the North Carolina State College is offering the following short courses. Others will be offered in future summer schools whenever there are sufficient demands. These courses do not give college credit.

Short Course for Janitors and Firemen—August 9-13, 1937

The Mechanical Engineering Department of North Carolina State College, as a feature of the summer session, conducts a short course of six days for white janitors and firemen, teaching the fundamental principles of combustion, how to fire economically, and giving 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 1937 school will be held the week of August 9-13. Applications for admission should be sent to Professor L. L. Vaughan, North Carolina State College, Raleigh, North Carolina.

Short Course for Waterworks Operators—July 26-30, 1937

The Chemical Engineering Department of the North Carolina State College conducts a three-day short course for waterworks operators. The chemical background of water treatment will be presented simply, definitely, and comprehensively, with the purpose of making clear to waterworks men the nature of the chemicals used and their reactions, the principles involved in the chemical treatment of water for municipal and for industrial use, and an explanation of the control processes. Each individual will be provided with a short lithoprinted book of complete lessons studied, every lesson accompanied by experimental demonstrations to make the study concrete and practical. The course is designed to present in a clear practical way the fundamental principles of chemical treatment of water so as to give a measure of understanding and assurance in the minds of waterworks men in their waterworks practice. Classes will be held from 8 a.m. to 1 p.m. and from 2 p.m. to 4.30 p.m. Application for admission should be sent to Professor E. E. Randolph, North Carolina State College, Raleigh, North Carolina.

Short Course for Gas Plant Engineers and Operators
August 2-6, 1937

The Chemical Engineering Department of the North Carolina State College conducts a three-day short course for gas plant engineers and operators. The course will include a comprehensive study of the fundamental principles of the manufacture of municipal and of industrial gas, the chemical reactions and principles involved, engineering problems, and control methods, together with clear, simple, and practical study of chemical nature of commercial gases, and of associated products; maintenance of uniform quality of product, prevention of losses and operation difficulties, and the chemical background of the various phases of gas production. The course is intended to be of definite help to operating men in gasworks. The class work will be fully illustrated with practical experiments. Classes will be held from 8 a.m. to 1 p.m. and from 2 p.m. to 4:30 p.m. Application for admission should be sent to Professor E. E. Randolph, North Carolina State College, Raleigh, North Carolina.

COLLEGE PREPARATORY MATHEMATICS AND ENGLISH

There are a large number of students applying for admission who are deficient in the mathematics requirement for college entrance. This is particularly true of those students who desire to take engineering.

Tests conducted at this College for several years show conclusively that students poorly prepared in English have difficulty with all their major college studies. The College Preparatory Course in English will improve the student in the three most important aspects of English: reading, writing, and speaking.

Plane geometry is required of all freshmen for college entrance. Since many of the smaller high schools in the State do not offer this subject, it is given here so that students may enter college without conditions. Students cannot begin their freshman mathematics without this course.

Solid geometry is an entrance requirement for all engineering freshmen. It may be taken as an extra load during the second term of the freshman year. However, securing this training during the summer will be of great assistance to the student in his freshman year.

Many students having passed high school algebra are still poorly prepared for college mathematics. This is due to the short terms in the high school, overloaded teachers, and the fact that two or more years often elapse between taking high school algebra and entering college. A review course in algebra is offered to enable the student to secure a good foundation for his college mathematics.

In an effort to avoid these difficulties and to prepare students more thoroughly for freshman work, the College is offering this special college preparatory instruction in mathematics and English during the summer session. High school students planning to enter college are advised to consider this special instruction for the following reasons:

1. Better preparation means a better college record, which is often the basis of future recommendations and employment.
2. The removal of conditions which eliminate many undesirable irregularities.
3. Gaining experience in activities on a college campus which will aid in making a better start in September.
4. Lessening the possibility of scholastic failure in college.

The cost of this instruction is very reasonable. The estimate of expenses for the six weeks is as follows:

1. Room rent	\$ 7.50
2. Board in College Cafeteria (estimate).....	30.00
3. Registration fee	3.00

To these items should be added the tuition charge for the courses as listed in the description of courses given below:

Eng. s50. College Preparatory English. Five hours a week. No college credit. Mr. Clark and staff. 8 M. T. W. T. F. Pu. 108. Tuition, \$9.00.

A course in the fundamentals of reading, writing, and speaking. Special emphasis will be given to the needs of the individual students; conferences will be held for the purpose of directing the activities of the course.

Math. s1. Plane Geometry. Ten hours a week. No college credit. Staff. 11-1 M. T. W. T. F. P. 100. Tuition, \$15.00.

The usual theorems and exercises of plane geometry, as given in the preparatory and high schools.

Math. s2. Solid Geometry. Five hours a week. No college credit. Staff. 10 M. T. W. T. F. P. 100. Tuition, \$9.00.

Selected theorems and exercises, emphasizing particularly the practical aspects of the subject, such as the volumes and surfaces of prisms, pyramids, cylinders, cones, the frustums of pyramids and cones, and the sphere.

Math. s3. Elementary Algebra. Ten hours a week. No college credit. Staff. 8-10 M. T. W. T. F. P. 100. Tuition, \$15.00.

The usual topics in elementary algebra, including addition, subtraction, multiplication, division, fractions, exponents and surds, graphs, and quadratic equations.

SUMMER INSTRUCTION IN FORESTRY

June 8 to August 14

The regular summer instructions in forestry for sophomores from June 8 to August 14 will be divided as follows:

Surveying—June 8 through June 26
Dendrology—June 28 through July 17
Mensuration—July 19 through July 31
Silviculture—August 2 through August 14.

The expenses for the entire period will be as follows:

Registration fee	\$ 5.00
For each credit scheduled	3.00
Room and board based on last year's expenses (estimated)	50.00
Bus fee	17.00

The courses listed below are required and carry the regular college credit as indicated. The work is carried on entirely in the field and the class is responsible for its own program of camp routine. The students furnish their own board and any facilities other than the beds and housing. The registration in these courses is restricted to regularly enrolled students, unless a student is admitted as a special student under the same conditions that a special student would be allowed to take work in the regular courses.

Civil Engineering. s101. Surveying and Mapping. 3 Credits. Mr. Fontaine and Mr. Bramer.

Includes Boundary Surveys; Topographical Surveys and calculations of sections of the school forest areas. A complete topographic map including all field data is required.

For. s200. Mensuration. 3 Credits. Mr. Slocum and Mr. Miller.

The summer course in mensuration consists of two weeks field work. The work is carried on at the Hill Forest Camp or on the White Oak Pocosin. Practical work in timber cruising, stem analysis, mill studies, log scaling and collection of data for yield, volume and stand tables is carried out.

For. s203. Silviculture. 3 Credits. Mr. Miller and Mr. Slocum.

Classification of forest types. Reproduction studies. Establishment and measurement of sample plots. Correlation of depth of water table with site quality. This work is carried on at the White Oak Forest in the coastal section of North Carolina.

For. s211. Dendrology. 3 Credits. Mr. Slocum and Mr. Miller.

North Carolina is well suited for the study of dendrology. Representative trees of eastern United States are found here, scattered throughout the State. The summer course in dendrology consists of three weeks field work, one week being spent in each of the sections of the State, namely, the Mountains, Piedmont and Coastal Plain.

SPECIAL THREE WEEKS' COURSES FOR TEACHERS OF VOCATIONAL AGRICULTURE

June 14 to July 2

The State College Summer Session will again offer special three weeks' courses for teachers of vocational agriculture from June 14th to July 2nd. Courses will be offered in both subject matter and professional fields, and an effort will be made to arrange the work to meet the most urgent needs of teachers. A special announcement of these courses will be issued soon.

The expenses for each three weeks' term will be as follows:

Registration fee	\$ 1.50
For each term credit scheduled --	3.00
Room rent (each student—two in a room).....	4.00
Board (estimate of cafeteria cost).....	15.00

COURSES TO BE OFFERED IN THE SUMMER SESSION

ABBREVIATIONS FOR BUILDINGS

C.—Ceramic	Pk.—Polk Hall
C.E.—Civil Engineering	Pr.—Primrose
G.—Gymnasium	Pt.—Patterson
H.—Holladay	R.—Ricks
P.—Page	T.—Textile
P. & E.—Physics and Electrical Engineering Building	Fu.—Pullen Hall
Pe.—Peele Hall	W.—Winston
	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. 207. Prerequisite: Econ. 102 or 103.

A study of the economics of agricultural production; marketing of farm products; farm credit; land tenure and other major economic problems of the farmer.

Agr. Econ. s370. Agricultural Extension Methods. Three credits. Prerequisite: Senior or graduate standing. Dean Schaub and staff. Hours by arrangement.

A study of office record systems, office management, program determination, program development, reports and their use; and the obtaining, preparation, and use of material in Extension teaching.

Rur. Soc. s302. Rural Sociology. Five hours a week. Three credits. Mr. Matthews. 11 M. T. W. T. F. R. 207. Prerequisite: Soc. 103 or Econ. 102.

The culture, social organization, and social problems of rural people, with special reference to Southern rural life and proposed programs of development.

AGRICULTURAL ENGINEERING

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

A study of modern mechanical equipment for the farm.

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

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

ANIMAL HUSBANDRY AND DAIRYING

A. H. s101. Animal Nutrition I. Three credits. Mr. Ruffner. By arrangement.

A study of animal nutrition; physiology of digestion; nutrients; feeding standards; economical and balanced rations. Practical work given.

A. H. s208. Dairying. Three credits. Mr. Haig. By arrangement.

The secretion, composition and properties of milk are studied, with factors influencing quality and quantity of milk and cream. The use of the Babcock tests, butter making on the farm, and operation of cream separators constitute the laboratory work.

A. H. s201. Swine Production. Three credits. Mr. Hostetler. By arrangement.

A study of adaptability of swine, with emphasis on feeding, judging, and management.

A. H. s202. Animal Breeding. Three credits. Mr. Ruffner. By arrangement.

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

Courses for Graduates Only

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

An intensive study of experimental data.

BOTANY

Bot. s101. General Botany. Five recitations, four hours laboratory. Four credits. Mr. Shunk. 8 M. T. W. T. F., 2-4 M. W. Pt. 38.

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. 9 M. T. W. T. F., 2-4 T. Th. Pt. 38.

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. Five recitations, four hours laboratory. Four credits. Mr. Shunk. Prerequisite: Botany 102 or equivalent. 11 M. T. W. T. F., 2-4 T. Th. Pt. 38.

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

Courses for Graduates Only

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.

CHEMISTRY

Chem. s101. General Chemistry. Five hours in classroom and four hours in laboratory each week. Four credits. Equivalent to first term General Chemistry as given in the regular college year. Mr. Wilson or Mr. 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 four hours in laboratory each week. Four credits. Equivalent to second term General Chemistry as given in the regular college year. Mr. Satterfield. 10 M. T. W. T. F.; 1-5 Th. W. 102.

Particular attention given to chlorine, sodium, nitrogen, sulphur, 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; sulphur 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 four hours in laboratory each week. Four credits. Equivalent to third term General Chemistry as given in the regular college year. Mr. Wilson or Mr. Satterfield. 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 phosphorus, 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. s211. Qualitative Analysis. Two hours lecture, with four laboratory periods of three hours each per week. Equivalent to one term of college work. Five hours credit. Prerequisite: General Chemistry. Mr. Wilson. 10 T. Th.; laboratory to be arranged. W. 217.

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. s212. Quantitative Analysis, A. Two lectures and twelve hours laboratory. Equivalent to one term of college work. Five hours credit. Prerequisite: Qualitative Analysis. Mr. Wilson. Arrange. W. 217.

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. s213 (214). Quantitative Analysis. Five credits. Mr. Wilson. Required of sophomores in Chemical Engineering and those majoring in Chemistry. Prerequisite: Chem. 211. By arrangement. W. 217.

A continuation of Chem. 212. Substances of more difficult nature are analyzed—minerals, steel, alloys, limestone, Paris green, etc.

Chem. s241. Introduction to Organic Chemistry. Four hours class and five hours laboratory. Four credits. Mr. Satterfield. Prerequisite: Chem. 101, 103, 105. 8 M. T. W. T., 2-4:30 M. W.

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

††**Chem. s321. Organic Chemistry.** Four hours class and five hours laboratory for each four hours credit. Hours by arrangement.

††Not offered in 1937.

Staff. (This course has a total of 12 credits and continues through the regular college year.) Prerequisite: Chem. 101, 103, 105.

Aliphatic and aromatic compounds; practical applications; methods of preparation and purification of compounds.

†Chem. s340. **Food Products and Adulterants.** Five hours a week. Three credits. Prerequisite: Chem. 101, 103, 105, and 241. Mr. Satterfield. 9 M. T. W. T. F.

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

†Chem. s341. **Vitamins.** Five hours a week. Three credits. Prerequisite: Chem. 241 or 321. 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.

†Chem. s344. **Food and Nutrition.** Five hours a week. Three credits. Prerequisite: Chem. 241 or 321. 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. Leager. 8 M. T. W. T. F. Pe. 108.

This course is designed for those students who do not feel able to devote more than one term to the study of economics.

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. s103a. **General Economics.** Five hours a week. Three credits. Mr. McNatt. 8 M. T. W. T. F. Pe. 206.

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.

Econ. s103b. **General Economics.** Five hours a week. Three credits. Mr. McNatt. 9 M. T. W. T. F. Pe. 206.

This is the second term of the regular college course in General Economics.

Econ. s103c. **General Economics.** Five hours a week. Three credits. Mr. McNatt. 11 M. T. W. T. F. Pe. 206.

This is the third term of the regular college course in General Economics.

†Offered in 1937, not offered 1938.

Econ. s112. Accounting for Engineers. Five hours a week. Three credits. Mr. Shulenberger. 9 M. T. W. T. F. Pe. 108.

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. s210. Business Organization. Five hours a week. Three credits. Prerequisite: Econ. 102 or 103. Mr. Shulenberger. 8 M. T. W. T. F. Pe. 109.

Forms of business enterprise, single enterprise, partnership, 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. Shulenberger. 10 M. T. W. T. F. Pe. 109.

Required of seniors in Business Administration and in Ceramic, Chemical, Civil, Architectural, Electrical, and Mechanical Engineering. 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. 109.

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

Econ. s330. Principles of Insurance. Five hours a week. Three credits. Prerequisite: Econ. 103 or equivalent. Mr. Shulenberger. 11 M. T. W. T. F. Pe. 108.

Risk as an element of all agricultural and industrial activity. Such risks as can be covered by insurance are discussed, with the appropriate form of insurance, e. g., employer's liability, workmen's compensation, fire, life, and other forms.

Econ. s314. Forecasting Business Conditions (Business Statistics). Five hours a week. Three credits. Prerequisite: Econ. 102 or 103. Mr. Leager. 12 M. T. W. T. F. Pe. 108.

Price levels, the business cycle, business barometers, business forecasting.

Econ. s326. Public Finance—Social Security. Five hours a week. Three credits. Prerequisite: Econ. 103. Mr. Moen. 9 M. T. W. T. F. Pe. 109.

Social Security, classes of income and expenditure, taxation.

EDUCATION

Courses for Undergraduates

Ed. s203a. Educational Psychology. Five hours a week. Three credits. Required of students in Education; elective for others. Mr. Garrison. 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. Garrison. 10 M. T. W. T. F. H. 5.

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.

Ed. s307. Methods of Teaching Agriculture. Three credits. Messrs. Cook and Armstrong. 8 M. T. W. T. F. Required of students in Agricultural Education. Prerequisites: Ed. 203, 208, or equivalents, and at least twelve credits in Agriculture.

Organization of subject matter; teaching techniques; supervised practice; textbooks and reference material; Future Farmers of America; room arrangement and equipment.

VOCATIONAL GUIDANCE.—Guidance is recognized as a part of the work of each teacher in the school. Pupils of all ages require assistance in the 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 require 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.

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.

The course in Vocational Guidance is intended to give emphasis to the place of guidance in the school program. It will treat of the development of educational and vocational guidance, its relation to personnel work, principles and practices of guidance and employment, child legislation, and forms and records for school use.

Ed. s321. Vocational Education. Five hours a week. Three credits. Mr. Boshart. Prerequisite: Twelve credits in Education. 11 M. T. W. T. F. H. 16.

This course, dealing with the problems of vocational education, is intended to give acquaintance with its underlying philosophy, its place in our education, the laws governing it, and the prevailing practices and administration. It is of particular interest to administrators and teachers who have or expect to have to do with the direction of educational work in agriculture, homemaking, industry, and commerce. It deals with all-day, evening, part-time, and general continuation class work.

***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.

INDUSTRIAL ARTS.—The summer session will emphasize the preparation of teachers, supervisors, and principals for teaching and directing industrial arts in the various communities of North Carolina. The rapid growth of industrial education in our State is creating a demand for a competent personnel for making this work a definite functioning element in education rather than a type of "busy work," as is so often likely to be the case. Courses will be offered in subject matter, methods of teaching, administration, shop practice, and drawing.

Industrial arts depends largely upon the soundness of the philosophy underlying its introduction into the field of education. For this reason professionally minded teachers and administrators will welcome courses giving them a better basis for their classroom activity.

Principals, supervisors, and teachers are needed to introduce and develop the various phases of industrial education in our junior and senior high schools, part-time and continuation schools, and evening schools. The demand is for those who are familiar with both general and vocational education and at the same time capable of placing the proper emphasis upon the more practical phases of education. Supporting courses are offered in the Engineering and Textile Schools.

The underlying purpose of the courses offered in this field is to acquaint those who are responsible for developing the possibilities of industrial arts and other shop activity in our school system with prevalent practices and to give helpful aids in program construction. The possibilities of creating interest and motivating school subjects are often lost sight of because of the lack of knowing how to utilize the everyday things about us.

For those who are interested in administrating and teaching industrial arts, the following courses will be offered: The Theory of Industrial Arts, Practical Arts Problems, the Development of Vocational Education, and Problems of the General Shop versus Problems of the Unit Shop, all of which are correlated with courses in mechanical drawing, woodwork, metal work, electrical work, textiles, and auto-mechanics. These courses will be taught by instructors of wide experience helpful to teachers of general shop and unit courses.

We have teachers of academic subjects who have had fine experience in working with tools. These teachers, with the aid of summer session classes in the Department of Industrial Arts, could readily prepare themselves to meet the requirements for teaching shop and drawing classes.

Credit for these courses may be used for college credit, raising certificates, or renewing certificates. Teachers desiring to raise or renew their certificates will take the first two 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. Textiles 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. s321. Vocational Education.** Five hours a week. Three credits.
- ***Ed. s881. Guidance and Discipline of Students.** Five hours a week. Three credits.

Note: The above courses are described elsewhere in this bulletin. Attention is also called to the courses listed under Engineering which are especially designed for teachers of Industrial Arts and Trades and Industries.

- Ed. s352. Theory of Industrial Arts.** Five hours a week. Three credits.
Prerequisite: Twelve credits in Education. Miss Bell. 11 M. T. W. T. F. H. 15.

A study of the value and place of Industrial Arts in the public school. A study of the industries will be made with the idea of making suitable selection of projects to correlate with other school subjects and to aid in the development of methods and directions for activity work in the early grades. Intended for teachers, supervisors, and principals. Emphasis will be placed upon the use of the Industrial Arts to motivate and sustain effort in the learning process.

- Ed. s354. Practical Arts Problems.** Five or ten hours a week. One and one-half credits or three credits. Prerequisite: Twelve credits in Education or the consent of the instructor. Miss Bell. 9-11 M. T. W. T. F. H. 15.

Intended for the classroom teacher and supervisor for acquaintance with materials and how to use them. Instruction will be given in the making of posters, block printing, stenciling, work with plastics as clay and plasterine, making of baskets from reeds, raffia, and other materials, paper and cardboard instruction, and in the use of such other materials as are suited to the work in hand. It will be of aid to administrators in the development of the activity program.

- Ed. s357. The Problems of the General and Unit Shops.** Five hours a week. Three credits. Mr. Boshart. 9 M. T. W. T. F.

Intended for those who are teaching or expect to teach shop work and drawing. Its purpose is to acquaint students with the possibilities of the general shop as compared with those of the unit shop and to aid in setting up procedures for each type of shop under conditions where they can best function. Those taking this course should take parallel courses in shop instruction, unless they have had considerable experience. Problems of organization, equipment, instruction sheets and their uses, and courses of study will be considered.

- Ed. s360. Special Problems in Teaching Agriculture.** Five hours a week. Three credits. Prerequisite: Twelve credits in Education, including

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

Methods of Teaching Agriculture. Messrs. Cook and Armstrong. 10 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.

*Educ. s371. **Psychology of the Exceptional Pupil.** Five hours a week. Three credits. Prerequisite: Twelve credits in education, six of which must be in Psychology. Mr. Garrison. 11 M. T. W. T. F. H. 3.

A study of the psychological characteristics and educational treatment of the gifted and subnormal pupil. The child with specific sensory defects will also receive consideration.

†Educ. s381. **Guidance and Discipline of Students.** Five hours a week. Three credits. Prerequisite: Twelve credits in Education. Mr. Cook. 9 M. T. W. Th. F.

Factors influencing character development; responsibilities and opportunities of teachers and administrators for the moral and civic conduct of their students; recent trends; difficulties; materials and procedures.

Ed. s412. **Occupational Counseling.** Five hours a week. Three credits. Mr. Boshart. Prerequisite: Ed. 320, 332 or equivalent. 12 M. T. W. T. F. H. 16.

This course is intended for teachers of experience and those interested in the problems of guidance in school and life. Attention is given to group and individual counseling as it may be applied to the junior and senior high schools, colleges, or placement offices, and to the procedures of conducting interviews and conferences. Information concerning occupational material will be organized, evaluated, and applied to type cases. The relation to personnel work will be considered as the functions of school and industry are studied.

Ed. s416. **Problems in Agricultural Teaching.** Five hours a week. Three credits. Prerequisite: Ed. 203, 307, and at least twelve 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. s420. **Agricultural Education Seminar.** One credit. Mr. Cook, Mr. Armstrong. By arrangement. Prerequisite: Eighteen credits in Education.

A critical review of current articles and books of interest to students of agricultural education.

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

ENGINEERING

A. E. s107. **Pencil Sketching.** Five hours per week. Three credits. Mr. Paulson. 9 M. T. W. Th. F. A. E. 307.

Quick sketching of objects as seen and imagined in perspective. Elementary principles of perspective, especially as an aid to visualization.

†Not offered 1937.

A. E. s113. Fine Arts for Teachers. Eight hours per week. Three credits. Mr. Paulson. 11 M. T. W. Th. F., 12 M. W. F. P. & E. 307.

Black and white, and color drawing adapted to grade school use. Lettering, illustrating, poster making, etc.

A. E. s214. Art Appreciation for Teachers. Five hours a per week. Three credits. Mr. Paulson. 8 M. T. W. Th. F. P. & E. 307.

Picture study of the list suggested by the State Board of Education for grade school use, including paintings, architecture, and sculpture.

C. E. s102. Surveying I. Three credits. Staff. 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.

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. Laboratory fee \$2.00.

C. E. s240. Advanced Surveying. Three credits. Staff. Required in the summer immediately following the sophomore year in Civil Engineering. Prerequisite: C. E. 206 and 207.

Plane table practice, special problems in surveying practice; triangulation, railroad and highway spirals; hydrographic surveying with sextant; plane table problems; the use and rating of current meters; measurement of stream flow; drainage problems. Laying out proposed construction work. Topography, details, special problems. Laboratory fee \$2.00.

C. E. s200—A, B or C. Mechanics. Six hours a week. Three credits. Mr. Smith. Required of all students in engineering. C. E. 222.

Mechanics A: Statics, con-current, non-current and parallel forces systems; friction.

Mechanics B: Kinematics, centroids and moment of inertia.

Mechanics C: Kinetics, work, power, energy, impulse and momentum.

C. E. s203. Strength of Materials. Six hours a week. Three credits. Mr. Smith. Required of all students in engineering. C. E. 222.

Stresses in beams, columns and shafts. Shear, flexure, and deflection of columns. Beams with two or more supports.

E. E. s101. Electrical Engineering Fundamentals. Twelve hours a week. Six credits. Mr. Fouraker. P. & E. 205.

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. Briggs. 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. Briggs. 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. s105. Woodworking. Eight or twelve hours a week. Two or three credits. Required of sophomores in Engineering. Mr. Wheeler.

Deals with elementary joinery, finishing, theory of dry-kilning, wood turning. Lectures, demonstrations, and practice in hand work and machine methods. Typical patterns and core boxes are constructed, such as solid, split, and loose-piece patterns; mounting of patterns on boards and their preparation for use in the foundry.

M. E. s110. Mechanical Drawing. Eight or sixteen hours a week. Two or four credits. Mr. Briggs. P. 106.

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

M. E. s219. Machine Shop II. Four, eight, or twelve hours a week. One, two, or three credits. Mr. Wheeler.

Includes laying out work, grinding tools, chipping, drilling, tapping, babbitting bearings and scrapping. Machine work, including centering, straight and taper turning, chicking, screw cutting, shaper work, planer work and index milling, and gear cutting.

SHOP AND DRAWING COURSES FOR INDUSTRIAL EDUCATION TEACHERS

M. E. s210. Mechanical Drawing for Teachers. Ten hours a week. Three credits. Mr. Briggs. 8-10 or 10-12 M. T. W. Th. F. P. 106.

Intended for those teaching or preparing to teach mechanical drawing and shop practice. Consists of lectures and drawing-room practices involving problems for the junior and senior high school mechanical drawing. The elements of lettering, instrument practice, projections, intersections, developments, tracing, blue-printing, and methods of instruction will be considered. (For advanced work in drawing see Architectural and Mechanical Engineering.)

M. E. s240. Auto Mechanics. Ten hours a week. Three credits. Mr. Bridges. 2-4 M. T. W. Th. F. Shops.

Intended for teachers and prospective teachers of auto mechanics where they may obtain acquaintance and experience in dealing with instruction units for junior and senior high schools. Consideration will be given to the organization of teaching material, shop layout, shop management, selection of tool equipment, and tool-room operation.

M. E. s250. Woodworking for Teachers. Ten hours a week. Three credits. Mr. Rowland. 2-4 M. T. W. Th. F. Shops.

Stresses practical methods for teaching woodwork in general and in unit shops on the Industrial Arts basis. Problems considered are to be used chiefly for grades seven, eight, and nine, or older pupils when beginning. Deals primarily with hand tools, common woods, and elementary finishes.

M. E. s350. Woodworking for Teachers (Advanced). Ten hours a week. Three credits. Prerequisite or its equivalent and consent of the instructor. Mr. Rowland. By arrangement. Shops.

Emphasis is placed on educationally significant projects adapted to older students where the use and care of both hand and machine tools is an important factor. Opportunity for practice in grinding edged tools, filing and setting of saws, the maintenance of other tools, and the organization and management of tool rooms and supplies.

ENGLISH

Eng. s101. Composition. Five hours a week. Three credits. Mr. Hartley. 8 M. T. W. T. F. Pu. 103.

Illustrative readings and exercises in types of composition; long paper; collateral reading.

Eng. s202. Advanced English Grammar. Five hours a week. Three credits. Mr. Ladu. 11 M. T. W. T. F. Pu. 105.

For teachers of English in high schools and in the grades, and for journalists and other creative writers. The science of grammar and the art of its application.

Eng. s221. Survey of American Literature. Five hours a week. Three credits. Prerequisite: Eng. 101. Mr. Ladu. 8 M. T. W. T. F. Pu. 105.

Equivalent to the second term in the regular session; from 1840 to 1900.

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 literary thought in connection with its European background.

***Eng. s320. The Short Story.** Five hours a week. Three credits. Prerequisite: Eng. 101 and three additional credits in English. Mr. Hartley. 11 M. T. W. T. F.

Development, structure, types, and style of the present-day short story; papers, collateral reading.

***Eng. s332. The Romantic Period.** Five hours a week. Three credits. Prerequisite: Eng. 101 and three additional credits in English. Mr. Hartley. 9 M. T. W. T. F. Pu. 103.

Representative poems of Gray, Blake, Burns, Wordsworth, Coleridge, Scott, Byron, Shelley, and Keats.

***Eng. s337. Contemporary American Literature.** Five hours a week. Three credits. Prerequisite: Eng. 101 and three additional credits in English. Mr. Ladu. 10 M. T. W. T. F. Pu. 105.

Study of 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 50 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. 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 or six 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. s325. Seed Certification Problems. Five hours a week. Three credits. Mr. Darst. Prerequisite: F. C. 101. Arranged. Pt. 26.

A study of standards for quality in field crops for certification.

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

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. 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 in the earth's crust.

Geol. s291. Geology of North Carolina. Three lectures; four hours laboratory. Three credits. Mr. Stucky. 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. Economic History. Five hours a week. Three credits. Mr. Bauerlein. 8 M. T. W. T. F. Pe. 1.

A survey course dealing with the European background of American history; English colonization and government; and colonial agriculture, industry, finance, commerce, and social life. The economic background of the Revolution and the problems confronting the states during and after the War for Independence will also be considered.

Hist. s101b. Economic History. Five hours a week. Three credits. Mr. Bauerlein. 9 M. T. W. T. F. Pe. 1.

The economic aspects of the beginnings of the government under the Constitution; a consideration of the economic growth of the United States, 1790 to 1860 in the fields of commerce, industry, agriculture and finance with some attention to parallel developments in Europe and the effects of the Industrial Revolution; the struggle between the North and South, 1861-1865 in the light of its economic significance.

Hist. s200. American National Government. Five hours a week. Three credits. Mr. Seegers. 10 M. T. W. T. F. Pe. 4.

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. s204a. European History. Five hours a week. Three credits. Mr. Seegers. 9 M. T. W. T. F. Pe. 4.

A survey of European history from the dawn of the modern era to the French Revolution. The renaissance, reformation, and rise of national states; imperial rivalries of the early modern period; the commercial, agricultural, and intellectual revolutions; the development of democratic institutions in the seventeenth and eighteenth centuries.

***Hist. s301a. The Colonial Period of American History.** Five hours a week. Three credits. Prerequisite: History 101. Mr. Bauerlein. 11 M. T. W. T. F. Pe. 1.

The European background of colonial America; the English settlements; expansion of the English colonies with respect to economic growth, con-

stitutional development and social conditions; relations with colonial neighbors and the English government; and a consideration of the American Revolution.

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. 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.

MATHEMATICS

Math. s100a. Mathematical Analysis. Five hours a week. Three credits. Prerequisite: Algebra to quadratics and Plane Geometry. Mr. Cell. 11 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. s100b. Mathematical Analysis. Five hours a week. Three credits. Mr. Cell. 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. s100c. Mathematical Analysis. Five hours a week. Three credits. Mr. Williams. 9 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. Mumford. 11-1 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. Bullock. 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. Bullock. 11-1 M. T. W. T. F. Page 101A.

Loci of equations, the straight line, circle, parabola, ellipse, hyperbola, and the general equation of the second degree.

Math. s201. Differential Calculus. Eight hours a week. Four 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. Eight hours a week. Four 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. Eight hours a week. Four credits. Prerequisite: Mathematics 202. Mr. Cell. 8-10 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.

MODERN LANGUAGES

German

M. L. s108. Elementary German Prose. Five hours a week. Three credits. Mr. Ballenger. 11 M. T. W. T. F. Pe. 211-212.

This course consists of reading and translation of very simple German, along with lectures on the structure of the German language and work composition. The work is conducted in such a manner that the student's choice in reading material is a matter of individual need. Daily reports and conferences are required.

M. L. s204. Intermediate Scientific German. Five or ten hours a week. Three or six credits. Mr. Hinkle. 10 M. T. W. T. F. Pe. 211-212.

This course consists of a study of relatively simple scientific German literature. It is conducted by means of lectures and reports in such manner that the student's choice of reading material is a matter of individual need. Daily reports and conferences are required. Should be taken in conjunction with M. L. s108.

French

M. L. s107. Elementary French Prose. Five hours a week. Three credits. Mr. Ballenger. 8 M. T. W. T. F. Pe. 211-212.

This course consists of reading and translation of easy French, along with lectures on the structure of the French language, diction, and pronunciation. The work is conducted in such manner that the student's choice in reading material is a matter of individual need. Daily reports and conferences are required.

M. L. s212. Intermediate Scientific French. Five or ten hours a week. Three or six credits. Mr. Hinkle. 9 M. T. W. T. F. Pe. 211-212.

This course consists of a study of simple scientific French literature.

It is conducted by means of lectures and reports in such manner that the student's choice of reading material is a matter of individual need. Daily reports and conferences are required. Should be taken in conjunction with M. L. s107.

M. L. s310. French, German and Spanish Civilization. Five hours a week. Three credits. Mr. Hinkle. 11 M. T. W. T. F. Pe. 211-212.

This is a reading course dealing with the development of French, German and Spanish civilizations. The reading material is supplemented by lectures and reports on the manners and customs of the respective culture under consideration. The civilization studied during the Summer Session is optional with the enrollment of the class.

Spanish

M. L. s111. Elementary Spanish Prose. Five hours a week. Three credits. Mr. Hinkle or Mr. Ballenger. 12 M. T. W. T. F. Pe. 211-212.

This course consists of reading and translation of easy Spanish, along with lectures on the structure of the Spanish language, diction, and pronunciation. The work is conducted in such manner that the student's choice in reading material is a matter of individual need. Daily reports and conferences are required.

PHYSICAL EDUCATION

P. E. s101. Fundamental Activities. Four hours practice. One credit. Mr. Miller. By arrangement. Gym.

Freshman requirement. Individual health and physical efficiency of each student, based on standard athletic, gymnastic, and efficiency tests.

P. E. s102. Sports Activities. Four hours practice. One credit. Mr. Miller. By arrangement. Gym.

Sophomore requirement. Election permitted in the popular sports for healthful exercise and a fair degree of skill in them.

P. E. s114. Football—Theory and Practice. Five hours a week, three hours practice. Three credits. Mr. Miller. By arrangement. Gym.

This course will cover the organization of the theory and practice of football coaching.

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

This course will cover the organization of the theory and practice of basketball coaching.

P. E. s118. History and Principles of Physical Education. Four hours a week. 2 Credits. Mr. Miller. By arrangement. Gymnasium.

An historical survey of physical education, the conditions that influence physical activities among people. The relationship of Physical Education to growth and development and to general education.

PHYSICS

Physics s103. Physics for Textile Students. Four or eight credits. Five hours class work, two two-hour laboratory periods each week for four credits. Double this for eight credits. Mr. Lancaster. 9 M.

T. W. T. F.; 2-4 M. W.; 9-11 M. T. W. T. F.; 2-4 M. T. W. T. P & E
209. Prerequisite: Math 100.

Industrial Physics, with emphasis on practical applications to the textile industry.

Physics s104. Physics for Engineers. Four or eight credits. Mr. Meares.
8 M. T. W. T. F.; 2-4 M. W.; 8-10 M. T. W. T. F.; 2-4 M. W. P. & E. 212.

An advanced treatment of General Physics Second- or third-term work may be taken or the 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 s205. Light in Industry. Three hours credit. Mr. Lancaster.
11 M. T. W. T. F. P. & E. 209.

Fundamentals of light, illumination, and color, with the principles applied to the selection, mixing, harmony, matching, lighting, photography, and pigments.

***Physics s212. Photography.** Four hours class work and two laboratory periods each week. Three credits. Mr. Meares. 7 M. T. W. T. Laboratory by arrangement.

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

Physics s411. Research.

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

POULTRY SCIENCE

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

Common diseases of poultry as found in North Carolina; seasonal anticipation of diseases; autopsy methods and practice; poultry sanitation.

Poul. s310. Advanced Poultry Production. Three credits. Mr. Dearstyne or Mr. Williams. By arrangement.

Course especially adaptable to vocational teachers in agriculture. Includes poultry judging, nutrition, and commercial plant management.

Poul. s407. Poultry Research. Three credits. Staff. By arrangement. R. 208.

Problems in poultry nutrition, diseases, marketing, and breeding may be undertaken. Such problems shall be conducted on a definitely outlined basis acceptable to the department and the results shall be summarized in the form of an acceptable basis.

PSYCHOLOGY

Psychol. s101. Introduction to Psychology. Five hours a week. Three credits. Mr. Garrison. 9 M. T. W. T. F. H. 5.

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

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

(For a description of course, see Ed. 203a.)

Psychol. s203b. Educational Psychology. Five hours a week. Three credits. Required of students in Education; elective for others. Mr. Garrison. 10 M. T. W. T. F. H. 5.

(For a description of course, see Ed. 203b.)

***Psychol. s371. Psychology of the Exceptional Pupil.** Five hours a week. Three credits. Prerequisite: Twelve credits in education, six of which must be in Psychology. Mr. Garrison. 11 M. T. W. T. F. H. 3.

(For a description of course, see Ed. s371.)

RELIGION

Rel. s103. Social Ethics. Five hours a week. Three credits. Mr. Hicks. 10 M. T. W. T. F. Pe. 204.

Historical and psychological study of moral nature and moral progress; origin and development of the social conscience; and changing ethics in certain aspects of social life.

Rel. s201. Comparative Religion. Five hours a week. Three credits. Mr. Hicks. 12 M. T. W. T. F. Pe. 204.

History, general characteristics, and social significance of the great ethnic religions of the world, characteristics of the living religions.

SOCIOLOGY

Soc. s102. Introductory Sociology. Five hours a week. Three credits. Mr. Hicks. 11 M. T. W. T. F. Pe. 204.

This course offers an inductive introduction to the field of sociology by taking up a number of social problems which confront every community. 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. 9 M. T. W. T. F. Pe. 207.

The course deals with the basic principles of sociology, then analyzes society and its influence on human behavior. In the summer session, it is particularly orientated for those who are preparing to, or who are teaching in the field of the social sciences.

***Soc. s301. Social Pathology.** Five hours a week. Three credits. Prerequisite: Soc. 103. Mr. Winston. 10 M. T. W. T. F. Pe. 207.

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. 207.

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 s115. Soils. Five recitations and lectures, four hours laboratory. Four credits. Mr. Clevenger. Prerequisite: Geol. 120 and Chem. 101, 3, 5. 9 M. T. W. T. F. Laboratory arranged.

A study of the properties of soils and their relation to soil management.

Soils s265. Soil Fertility. Four hours of class, one laboratory period a week. Three credits. Mr. Clevenger. 11 M. T. W. T. Laboratory to be arranged.

A course dealing with the chemical and biological properties of soils as related to soil fertility.

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

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 developments 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.

If there is sufficient demand, a second summer session of textile courses will be offered from July 26 to September 3. Students interested in attending this special session should communicate with Dean Thomas Nelson of the Textile School as early as possible, but not later than July 10. The courses given will depend upon the requests received.

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.** Two 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 or four 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. 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. 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. s208. 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 doobby

looms; starting up warps in looms; fixing single and double index dobbies; pattern chain building; operation of dobby 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. s320, s321, s322. Cotton and Rayon Fancy Design I. Three, six, or nine credits. Mr. Shinn. 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 doups. 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.

Tex. s311. Fabric Analysis. Two credits. Mr. Shinn. By arrangement.

Analyzing samples of cotton, wool, worsted, linen, rayon, and silk fabrics for size of yarns, ends and picks per inch, weight of warp and filling, so as to accurately reproduce samples analyzed. Obtaining design, drawing in draft, chain, and reed plan for fancy fabrics, such as stripes, checks, extra warp and extra filling figures, leno fabrics, jacquard fabrics, draperies.

ZOOLOGY

Zool. s101. General Zoology. Five recitations, four hours laboratory. Four credits. Mr. Bostian. 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. Economic Zoology. Five recitations, four hours laboratory. Four credits. Mr. McCutcheon. 8 M. T. W. T. F. Laboratory arranged. Z. 8.

An elementary study of animals with special reference to the more important economic groups; designed to give the student a general knowledge of the animal kingdom.

Zool. s304. Genetics. Four credits. Mr. Bostian. By arrangement. Prerequisite: Bot. 101 and 102 or Zool. 101.

Basic principles of heredity and variation. Students carry on and analyze breeding experiments, analyze inheritance in various animals and plants.

Courses for Graduates Only

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.

THE WOMAN'S COLLEGE
OF
THE UNIVERSITY OF NORTH CAROLINA
GREENSBORO, N. C.

June 9 to July 17, 1937

A second Summer Session has been requested and approved by the President and the Summer Session Council. If funds are made available, it will begin immediately at the close of the first session.

The chief purpose of the Summer Session is to serve students and teachers of North Carolina to the greatest possible extent at the least possible cost.

Distinctive features of the Summer Session at the Woman's College are:

1. Courses in elementary and high school education.
2. Graduate work in Home Economics and Business Education.
3. New courses in Art.
4. Regular and special courses in Music.
5. Observation and Nursery School.
6. Conferences in Home Economics, Education, and Art.
7. Placement service without charge.
8. Social and recreational program under trained leadership.

Courses will be offered for college students who wish to advance their standing or make up work.

Expenses are as follows:

Fees and charges.....	\$20.00
Board, room, and laundry.....	33.00
	<hr/>
	\$53.00

For further information write:

DEAN W. C. JACKSON,
The Woman's College,
Greensboro, N. C.

THE UNIVERSITY OF NORTH CAROLINA
CHAPEL HILL, N. C.

The Summer Session 1937 (first term, June 10-July 21, second term, July 22-August 28) offers undergraduate and graduate courses in Archaeology, Astronomy, Botany, Chemistry, Comparative Literature, Dramatic Art, Economics and Commerce, Education, English, Fine Arts, Geology, German, History, Latin, Law, Library Science, Mathematics, Music, Pharmacy, Physical Education, Physics, Political Science, Psychology, Public Welfare, Romance Languages, Rural Social Economics, Sociology, and Zoology, by regular members of the teaching staff and distinguished visiting professors.

Numerous special courses, conferences, seminars, and institutes in the fields of the Social Sciences, Public Welfare, Political Science, Music, and Education and Public Relations will be held during the first term of the Summer Session.

EXPENSES

(For each term of six weeks)

LIVING ACCOMMODATIONS

Room rent in University Residence Halls (other than Spencer Hall or the Graduate Clubs) -----	\$ 7.50
Room rent in Spencer Hall and Graduate Woman's Club:	
Single room -----	22.50
Double room -----	15.00
Room rent in Graduate Men's Club -----	15.00
Board in University Dining Hall Cafeteria -----	30.00
(Estimated at \$20.00 a month)	

OTHER EXPENSES

Registration fee for each student -----	13.50
Course fee for each quarter-hour credit per term -----	2.25

For further information write:

R. B. HOUSE,
Dean of Administration,
Chapel Hill, N. C.