

# STATE COLLEGE RECORD

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## SUMMER SESSION

June 12—July 21, 1939

### 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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## CONTENTS

	PAGE
Administration and Faculty.....	5
General Information .....	9
Short Courses .....	11
College Preparatory Courses .....	12
Summer Instruction in Forestry.....	13
Three Weeks Courses for Teachers of Vocational Agriculture.....	14
Unit Courses for CCC Camp Advisers.....	14
Description of Courses .....	15
The University of North Carolina Summer Session .....	37
The Woman's College of the University of North Carolina Summer Session .....	39

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## SUMMER SESSION, 1939

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The twenty-sixth Summer Session of the North Carolina State College of Agriculture and Engineering of the University of North Carolina begins Monday, June 12th, and closes Friday, July 21st.

### 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 allows this institution to accept women students for the summer session on the same basis as men. During the regular session, however, women students must present a minimum of forty-eight semester hours of advanced standing for admission, and be enrolled in one of the regular curricula.

### DEGREES IN EDUCATION

No degrees in Education can be awarded by this institution, except in Agricultural Education, Vocational Education, and Industrial Arts Education.

### 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:

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 coöperative 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 cer-

tificate 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 1939-40 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 13th.

#### **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 12th. Students are expected to report in person on Monday, June 12th, so that they may begin class work on the morn-



ing of Tuesday, 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. The final date for completing registration is 5:00 p.m. Wednesday, June 14th.

### **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. Degrees will not be awarded until the candidates have been approved by the college faculty at their September meeting, and diplomas will be mailed to students as soon thereafter as possible.

### **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 1939 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**

The Mechanical Engineering Department of North Carolina State College, coöperating with the State School Commission, conducts a short course of five 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. Applications for admission should be sent to Mr. H. E. Kendall, State School Commission, Raleigh, North Carolina. Dates will be announced later.

#### **Short Course for Waterworks Operators**

The Chemical Engineering Department of the North Carolina State College conducts a four-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 so 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. Dates will be announced later.

#### **Short Course for Gas Plant Engineers and Operators**

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. Dates will be announced later.

#### **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.

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.

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. 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. 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.

### SUMMER INSTRUCTION IN FORESTRY

June 6 to August 12

The regular summer instructions in forestry for sophomores from June 6 to August 12 will be divided as follows:

Surveying—June 26 through July 15.

Dendrology—June 6 through June 17; and July 17 through July 22.

Mensuration—July 31 through August 12.

Silviculture—June 19 through June 24; and July 4 through July 29.

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 .....	22.00

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 12 to June 30**

The State College Summer Session will again offer special three weeks courses for teachers of vocational agriculture from June 12 to June 30. 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
Infirmary fee .....	.50

### **Unit Courses for CCC Camp Advisers**

**June 12-24, 1939**

A two weeks session especially for Educational Advisers of the Civilian Conservation Corps. The plan is to conduct such classes as will meet the needs of individual advisers and to hold conferences and discussions of the general phases of the work to be undertaken in the camps. There will be opportunities for instruction in methods of procedure, and vocational guidance.

There will be a charge of \$2.50 for room rent, \$10.00 for registration fee, and a small sum for actual cost of materials used. Meals may be procured at the college cafeteria or elsewhere. See page 10 for instruction as to what is needed in room.

## COURSES TO BE OFFERED IN THE SUMMER SESSION

### ABBREVIATIONS FOR BUILDINGS

C.—Ceramic	Pr.—Primrose Hall
C.E.—Civil Engineering	Pt.—Patterson Hall
D.—Daniels Hall	R.—Ricks Hall
G.—Gymnasium	T.—Textile
H.—Holladay Hall	Pu.—Pullen Hall
P.—Page Hall	W.—Winston Hall
Pe.—Peele Hall	Z.—Zoology
Pk.—Polk Hall	

### 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. s362. Farm Management.** Five hours a week. Three credits. Mr. Forster. 12 M. T. W. T. F.

In this course the problems of farm management will be studied from the practical or realistic point of view. Among the more important problems which will be studied are: the selection and combination of farm enterprises, the relation of the size of the farm to profits, factors involved in the selection of farm, farm implements and machinery, farm rental contracts—their content and how they should be prepared,—the physical layout of the farm and its relation to crop rotation, use of machinery and labor, the responsibilities and functions of the farmer as a manager, the importance of farming practices or obtaining the optimum combination of factors used in production, economic reports as aids to the organization and management of the farm, the proper use of farm credit in the operation and management of the farm.

**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.

### 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, Mr. Haig. By arrangement.

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

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

A study of the 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.

**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. s211. Animal Nutrition II.** Three credits. Mr. Ruffner, Mr. Haig. By arrangement. Prerequisite: A. H. 101.

A study of all feeding stuffs used in America; laws controlling feeding stuffs; preparation of feeds; home-mixed and commercial feeds.

**A. H. s304. Herd Improvement.** Three credits. Mr. Haig. By arrangement.

This course is designed for training students as supervisors of herd improvement associations in North Carolina. Rules for advanced registry are studied, and practical work in keeping feed costs, the Babcock test, and bookkeeping necessary for dairy associations.

#### 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

**Bot. s402. Bacteriology: Special Studies.** Three credits. Prerequisite: Botany 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. Wilson or 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, bismuth, 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 or Mr. Caveness. 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 or Mr. Caveness. Arranged. 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 or Mr. Caveness. 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. Arranged.

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

**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.

**Chem. s451. Chemistry Research.** Three credits. Prerequisite: 54 term credits in Chemistry. Open to all graduates. Mr. Satterfield, Mr. Wilson.

Special problems that will furnish material for a thesis.

## ECONOMICS

**Econ. s201. General Economics.** Five hours a week. Three credits. Mr. McNatt. 8 M. T. W. T. F. Pe. 109.

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. s202. General Economics.** Five hours a week. Three credits. Mr. McNatt. 9 M. T. W. T. F. Pe. 13.

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

**Econ. s205. Introduction to Economics.** Five hours a week. Three credits. Mr. Green. 8 M. T. W. T. F. Pe. 13.

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. s305. Business Organization.** Five hours a week. Three credits. Prerequisite: Econ. 102 or 103. Mr. McNatt. 8 M. T. W. T. F. Pe. 108.

Forms of business enterprise, single enterprise, partnership, joint-stock company, corporation, and principles of business management.

**Econ. s307. Business Law.** Five hours a week. Three credits. Prerequisite: Econ. 102 or 103. Mr. Green. 10 M. T. W. T. F. Pe. 108.

Required of seniors 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 corporations, negotiable instruments, bailments and carriers, personal property, suretyship and guaranty, bankruptcy, crimes in business.

**Econ. s315. Advertising.** Five hours a week. Three credits. Mr. Green. 9 M. T. W. T. F. Pe. 109.

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

## EDUCATION

### Courses for Undergraduates

**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.

**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. Prerequisite: Twelve credits in Education. Mr. Boshart. 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, covering the elementary, junior high and senior high divisions. It will treat of the development of edu-

cational and vocational guidance, the relation to personnel work, principles and practices of guidance in employment, child legislation, and forms and records.

**Ed. s321. Vocational Education.** Five hours a week. Three credits. Prerequisite: Twelve credits in Education. Mr. Smith. 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 system of 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, together with the interpretation of the newer ideas of practical education.

**Ed. s324. Methods Used in Occupational Studies.** Three hours a week. Three credits. Prerequisite: Twelve hours in Education or equivalent. Mr. Boshart. 10 M. T. W. T. F. H. 16.

This course is planned to acquaint teachers with the field of occupations, the selection of suitable instructional materials and its presentation to pupils. The classwork will consist of readings, discussions, visitations, lectures and reports. Analysis of leading groups of occupations will be made with the idea of selecting and preparing teaching units of occupational information or units for use in subject matter courses as civics, English, or shopwork.

**Ed. s325. Methods of Teaching Industrial Subjects.** Five hours a week. Three credits. Prerequisite: Twelve credits in Education. Mr. Smith. 9 M. T. W. T. F. H. 16.

This course is intended for those persons who are teaching or have a desire to teach industrial shop subjects. It should be of special interest to industrial arts teachers with trade experience, academic teachers with trade experience who would like to teach industrial subjects, and to men from industry who think they would like to teach.

Some of the topics that will be developed are: Federal regulations, objectives, pupil selection, what to teach, how to organize the material, and shop management.

**Ed. s328. Diversified Occupations.** Five hours a week. Three credits. Prerequisite: Twelve credits in Education. Mr. Smith. 10 M. T. W. T. F. H. 16.

This course is planned for the training of coordinators of studies in diversified occupations. It is intended for experienced teachers who in addition to their teaching have had a couple of years of occupational experience.

In this course typical topics to be discussed are: Federal regulations that must be met, selling the idea to the community, planning related technical information, the selection of students, listing occupations, selecting those occupations that are suitable, occupational analyses, how to start a new program, forms of agreement, equipment necessary, advisory committees, record forms and reports.

**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. 10 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 EDUCATION.**—The summer session will emphasize the preparation of teachers, supervisors, and principals for teaching and directing Industrial Education 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. Courses will be offered in subject matter, methods of teaching, administration, shop practice, and drawing.

Industrial Education 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 purposes of the courses offered in this field is to acquaint those who are responsible for developing the possibilities of industrial education 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 education, the following courses will be offered: The Theory of Industrial Arts and Practical Arts Problems are intended largely for the earlier grades while the Problems of the General and Unit Shop, Vocational Education, Occupational Studies, Methods of Teaching Industrial Education and Diversified Occupations are suited to the junior and senior high schools and vocational classes. These courses are correlated with those in mechanical drawing, woodwork, metal work, textiles, and auto-mechanics. They will be taught by instructors of wide experience and will be related to individual needs.

Teachers of academic subjects who have a background of experience in practical shop-work could readily prepare themselves to teach shop and drawing classes in the field of industrial education. The newer element in this field, Diversified Occupations, offers splendid opportunities for those who have had teaching experience and whose interests and abilities are suited to the development and organization needed by the coordinator.

The credit for these courses may be used in renewing certificates, raising certificates, earning new certificates, or college credit.

**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. Industries will be studied with the idea of finding how closely they are

related to our school subjects. Intended for teachers, supervisors, and principals who are interested in the study of modern educational trends. 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 development of grade units of work or centers of interest showing the relationship of Industrial Arts with the tool subjects. Practice will be given in making posters, block prints, stencils, plastics, baskets from reeds, raffia, and other materials. Other materials suited to the work in hand will be studied. It will be of aid to administrators in the development of the activity program.

**Ed. s368. Measurements in Educational Psychology.** Five hours a week. Three credits. Mr. Garrison. 11 M. T. W. T. F.

Prerequisite: Education 203, supplemented by credits in related fields. An introduction to the theory and practice of mental, educational and aptitude testing. A study will be made of the various types of tests useful in educational measurements and vocational guidance. A critical analysis is made of the methods of constructing tests and the application of the results to problems of teaching and guidance.

**Ed. s381. Character Education.** Five hours a week. Three credits. Prerequisite: Twelve credits in Education. Mr. Cook. 9 M. T. W. T. 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. s390. Philosophy of Industrial Education.** Ten hours a week for three weeks. Three credits. Mr. Fryklund. 8-10 M. T. W. T. F.

Place, function, and changing conceptions of industrial education in the curriculum; economic sociological, and psychological aspects, industrial arts and trade training, art and industrial education, the teacher and the public.

**Ed. s396. Current Problems in Industrial Arts.** Ten hours a week for three weeks. Three credits. Mr. Fryklund. 11-1 M. T. W. T. F.

Curriculum and course revision techniques, analysis techniques, testing, instruction sheets and general shop involve current problems for consideration. Conducted on a seminar basis. Reading assignments, lectures, reports.

**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. 11.

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 school, 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. Staff. 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.

### SHOP AND DRAWING COURSES FOR INDUSTRIAL EDUCATION TEACHERS

**M. E. s210. Mechanical Drawing for Teachers.** Ten hours a week. Three credits Mr. Fornes. 8-10 or 10-12 M. T. W. T. 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.) Text: Engineering Drawing by French.

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

Stresses method of making projects in woodwork as they should be presented in the shops of the public schools. Projects 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. Text: Instructional Units in Hand Woodwork by Tustison and Brown.

**M. E. s350. Woodworking for Teachers (Advanced).** Ten hours a week. Three credits. Prerequisite M. E. s250 or its equivalent and consent of the instructor. Mr. Cope. 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. Text: Principles of Woodworking by Hjorth.

### ENGINEERING

#### Architectural

**Arch. s100 Pencil Sketching.** Five hours per week. Three credits. Mr. Paulson. 9 M. T. W. T. F. D. 307.

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

**Arch. s104. Art Appreciation for Teachers.** Five hours per week. Three credits. Mr. Paulson. 8 M. T. W. T. F. D. 307.

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

**Arch. s114. Fine Arts for Teachers.** Eight hours per week. Three credits. Mr. Paulson. 11 M. T. W. T. F., 12 M. W. F. D. 307.

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

#### Civil

**C. E. s200. Surveying I.** Three credits. Mr. Geile and 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, levelling, stadia measurements; topographical surveying, plane table surveying; office work in connection with field surveying. Laboratory fee \$2.00. Text, Tracy, Surveying.

**C. E. s310. Advanced Surveying.** Three credits. Staff. Required in the summer immediately following the sophomore year in Civil Engineering. 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. Prerequisite: C. E. 223 and 227.

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.

#### Mechanical

**M. E. s101, s102, s103. Engineering Drawing I.** Eight or sixteen hours a week. Two or four credits. Required of Textile Freshmen. Mr. Fornes. 8-10 or 8-12 M. T. W. T. F. S. P. 106.

Drawing board work covering lettering, projections, sections, pictorial drawings, working drawings as related to textile machinery, tracing, and blue-printing. Text: Hoelscher and Mays "Basic Units in Mechanical Drawing."

**M. E. s105, s106. Engineering Drawing II.** Twelve or twenty-four hours a week. Three or six credits. Required of Engineering Freshmen. Agricultural Engineering Freshmen, Landscape Architectural Freshmen and Teachers of Industrial Arts Freshmen. Mr. Fornes. 8-10 or 8-12 M. T. W. T. F. S. P. 106.

Drawing-board work, covering lettering, pictorial drawings, projections, revolution, sections, intersection and development, working drawings, tracing, and blue-printing. Text: Engineering Drawing by French.

**M. E. s107. Descriptive Geometry.** Twelve hours a week. Three credits. Required of Engineering Freshmen, Agricultural Engineering Freshmen, Landscape Architectural Freshmen, and Teachers of Industrial Arts Freshmen. Mr. Fornes. 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. Text: Applied Descriptive Geometry by Warner.

**M. E. s121, s122, s123. Shopwork.** Four, eight or twelve hours. One, two or three credits. Required of sophomores in Chemical Engineering and freshmen in Textiles. Messrs. Maddison and Cope. 8-10, 10-12, or 2-4 M. T. W. T. F. Shop.

Use of bench tools, making cabinet joints operation and care of wood-working machinery. Correct methods of staining, varnishing, filling, and gluing various kinds of wood. The forging of iron and steel. Instruction and practice in molding and core making. Cupola practice. Text: Lecturers' Notes.

**M. E. s124. Shopwork.** Eight hours a week. Two credits. Required of sophomores in Mechanical Engineering and Industrial Engineering. Mr. Cope. 8-10, 10-12 or 2-4 M. T. W. T. F. Shop.

Deals with elementary joinery, finishing, theory of dry-kilning and 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. Text: Pattern Making by Turner and Town.

**M. E. s125. Shopwork.** Eight hours per week. Two credits. Required of sophomores in Mechanical Engineering and Industrial Engineering. Mr. Maddison. 8-10, 10-12 or 2-4 M. T. W. T. F. Shop.

Lectures, demonstrations, and practice in molding and core making, furnace operations, melting and casting of ferrous and non-ferrous metals and their alloys. Sand testing. Text: Foundry Work by Stimpson, Gray and Grennan.

**M. E. s126. Shopwork.** Eight hours per week. Two credits. Required of sophomores in Mechanical Engineering and Industrial Engineering. Mr. Maddison. 8-10, 10-12 or 2-4 M. T. W. T. F. Shop.

A study of the principles and practice as applied to the forging of wrought iron and steel. Lectures, demonstrations, and practice in forge welding. Tool making and heat treatment. Text: "Forging Practice" by Johnson.

**M. E. s111, s112, s113. Mechanical Drawing.** Eight or sixteen hours a week. Two or four credits. Required of sophomores in Mechanical Engineering and Juniors in Ceramic Engineering. Mr. Fornes. 8-10 or 10-12 M. T. W. T. F. S. P. 106.

Drawing-board work, covering machine fastenings, pipe fittings, elementary cams, technical sketching, working drawings, tracing, and blue-printing. Texts: Engineering Drawing by French, and Applied Descriptive Geometry by Warner.

**M. E. s131 or s132 or s133. Metallurgy.** Four or eight hours a week. Two or four credits. Required of sophomores in Mechanical and Aeronautical Engineering. Mr. Selkinghaus. 8, 9, 10, or 11 M. T. W. T. or F. P. 100.

An elementary course in the science of metals, regarding their properties, uses, methods of fabrication, production and refining. Includes theory of alloys, corrosion, and various phases of testing. Text: "Engineering Metallurgy", by Stoughton and Butts.

**M. E. s227, s228, s229. Machine Shop II.** Four, eight, or twelve hours a week. One, two, or three credits. Mr. Wheeler. 8-10, 10-12, or 2-4, M. T. W. T. F. Shop.

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. Text: Machine Tool Work by Turner.

#### ENGINEERING MECHANICS

**E. M. s201. Engineering Mechanics.** (abridged). Five hours a week. Three credits. 8:00 M. T. W. T. F. Room CE 223. Mr. Conner. Prerequisite: Math. 201. Co-requisites: Math 203 and Phys. 104. Text: Analytical Mechanics for Engineers by Seely and Ensign. Statics: Concurrent, parallel, and non-concurrent force systems; the determination of their resultants and conditions of equilibrium. Friction, centroids, and moments of inertia.

**E. M. s202. Engineering Mechanics.** (abridged). Five hours a week. Three credits. 11:00 M. T. W. T. F. Room CE 223. Mr. Conner. Prerequisites: E. M. 201 and Math 203. Co-requisite: Phys. 104. Text: Analytical Mechanics for Engineers by Seely and Ensign. Kinematics and Kinetics.

**E. M. s211. Engineering Mechanics.** Five hours a week. Three credits. 8:00 M. T. W. T. F. Room CE 223. Prerequisite: Math. 201. Co-requisites: Math. 202 and Phys. 104. Mr. Conner. Text: Analytical Mechanics for Engineers by Seely and Ensign. Statics: Concurrent, parallel, and non-concurrent force systems; the determination of their resultants and conditions of equilibrium. Friction.

**E. M. s212. Engineering Mechanics.** Five hours a week. Three credits. 9:00 M. T. W. T. F. Room CE 222. Prerequisites E. M. 211 and Math. 202. Co-requisites: Phys. 104 and Math. 203. Mr. Smith. Text: Analytical Mechanics for Engineers by Seely and Ensign. Kinematics, centroids, and moments of inertia.

**E. M. s213. Engineering Mechanics.** Five hours a week. Three credits. 12:00 M. T. W. T. F. Room C. E. 223. Prerequisites: E. M. 212 and Math. 203. Mr. Smith. Text: Analytical Mechanics for Engineers by Seely and Ensign. Kinetics: The Newtonian laws of motion, work and energy, power, impulse and momentum theories are studied and their applications to special engineering problems are illustrated.

**E. M. s220. Strength of Materials.** Five hours a week. Three credits. 10:00 M. T. W. T. F. Room CE 222. Prerequisites: E. M. 202 or E. M. 212, Math. 203. Mr. Conner. Text: Resistance of Materials by Seely. Stresses in beams, columns and shafts. Shear, flexure, elementary study of deflection of beams, and the design of columns.

**E. M. s221. Strength of Materials.** Five hours a week. Three credits. 11:00 M. T. W. T. F. Room C.E. 222. Prerequisites: E. M. 202 or E. M. 212 and Math. 203. Mr. Smith. Text: Elements of Strength of Materials by Timoshenko and MacCullough. A study of the stresses and strains in engineering materials. The study includes tension, compression, shear, and torsion, bending moments in simple beams. The fibre stresses in beams and their distribution throughout the cross section are studied in detail.



**E. M. s222. Strength of Materials.** Five hours a week. Three credits. 10:00 M. T. W. T. F. Room C.E. 223. Prerequisite: E. M. 221. Mr. Smith. Text: Elements of Strength of Materials by Timoshenko and MacCullough. A continuation of E. M. 221. Various methods are studied for finding the deflection of beams. The determination of stresses in statically indeterminate beams; the study of columns. Combined stresses.

**E. M. s230. Hydraulics.** Five hours a week. Three credits. 9:00 M. T. W. T. F. Room C.E. 223. Mr. Conner. Prerequisites: E. M. 202, or 213. Text: Hydraulics by Russell.

Fluid pressure, laws governing flow in pipes and conduits, flow through orifices and nozzles and over weirs; losses from friction and other sources. Methods of measuring the flow of streams; determination of water power.

### ENGLISH

**Eng. s101, s102, s103. Composition.** Five hours a week. Three credits. Messrs. Clark and Fountain. 8 M. T. W. T. F.; 11 M. T. W. T. F.; 12 M. T. W. T. F. Pe. 207; Pu. 101.

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

**Eng. s231. Public Speaking.** Five hours a week. Three credits. Mr. Fountain. 10 M. T. W. T. F. Pu. 101.

Prerequisite: Eng. 101, 102, 103.

Speech organization and effective delivery; extempore speeches; audience motivation and use of motivation process; acquisition of ease before audience.

**Eng. s263. English Literature III.** Five hours a week. Three credits. Mr. Clark. 11 M. T. W. T. F. Pe. 207.

Prerequisite: Eng. 101, 102, 103.

Masterpieces of the nineteenth century, with emphasis on changing tastes and ideas; the impact of scientific development on thought and literature. Parallel readings and papers.

**Eng. s286. The Romantic Period.** Five hours a week. Three credits. Mr. Clark. 9 M. T. W. T. F. Pe. 207.

Prerequisite: Eng. 101, 102, 103.

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

### FIELD CROPS

**F. C. s1. Cotton Classing.** Twenty hours a week for six weeks. No. college credit. 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.

The Cotton Classing course is designed for a special group, and does not carry collegiate credit. There is a charge of \$27.50 for the course in

Cotton Classing plus a \$1.00 infirmary fee. 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 seventeen 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. 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. s351. Crop Research.** Undergraduate credits, 3-9; Graduate credits, 2-6. Elective for graduates and advanced undergraduates. 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. Parker. 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 or six hours laboratory and field work. Three or four credits. Mr. Parker. 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. Parker. 12 M. W. F. Laboratory by arrangement. Pr. Elective. Prerequisite: Geol. 101, 120 or 201.

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. s101. Economic History.** Five hours a week. Three credits. Mr. Bauerlein. 8 M. T. W. T. F. Pe. 1.

An analysis of the social and economic forces at work in Europe which resulted in the colonization of America; topical treatment of the various phases of the economic life of the American colonists as a background for an examination of the economic aspects of the American Revolution and the formation of the Constitution of the United States.

**Hist. s102. Economic History.** Five hours a week. Three credits. Mr. Bauerlein. 9 M. T. W. T. F. Pe. 1.

Beginnings of national growth; westward expansion; consideration of the various phases of American economic life during the period prior to the Civil War as a basis for a treatment of the economic significance of Sectionalism; conditions in the North and South during the war.

**Hist. s322. Contemporary History of the United States.** Five hours a week. Three credits. Mr. Bauerlein. 11 M. T. W. T. F. Pe. 1.

A chronological treatment of the political, diplomatic and constitutional development of the United States during the twentieth century in the light of its economic and social significance.

## HORTICULTURE

**Hort. s102. Plant Propagation and Nursery Practice.** Three credits. Mr. Randall. 9 M. T. W. T., 2-4 M. W. Pk. 308. (Minimum enrollment eight students.)

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. 11 M. T. W. Th., 2-4 T. Th. Pk. 308. (Minimum enrollment eight students.)

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

## MATHEMATICS

**Math. s100b. Mathematical Analysis.** Five hours a week. Three credits. Mr. Clarkson. 12 M. T. W. T. F. Pu. 3. Text: Lee.

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. Cell. 9 M. T. W. T. F. Pu. 5. Text: Lee.

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. Park. 11-1 M. T. W. T. F. S. Pu. 2. Text: Fisher.

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. Clarkson. 8-10 M. T. W. T. F. S. Pu. 3. Text: Clarkson and Bullock.

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. Cell. 11-1 M. T. W. T. F. Pu. 5. Text: Smith, Gale and Neelley.

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

**Math. s202. Integral Calculus I.** Eight hours a week. Four credits. Prerequisite: Mathematics 201. Mr. Bullock. 11-1 M. T. W. T. F. Pu. 8. Text: Granville, Smith, and Longley.

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. Levine. 8-10 M. T. W. T. F. Pu. 4. Text: Granville, Smith, and Longley.

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. s304. Scientific German (Introductory).** Five or ten hours a week. Three or six credits. Mr. Hinkle. 10 M. T. W. T. F. Pe. 212. Prerequisite: M. L. 103-4 or equivalent.

This course consists of a series of readings and translations of relatively simple scientific German, supplemented by lectures on scientific terminology, word order, vocabulary analysis and other matters of linguistic technique. The work is designed to meet the needs of students whose interest in the language is primarily that of the acquisition of a reading ability. Since the choice of reading material is adjusted to individual needs, it may be taken by students of varying degrees of previous linguistic training. Daily reports and conferences are required. Students doing a translation project with this course will register for double credit.

### French

**M. L. s202. French Prose (Intermediate).** Five or ten hours a week. Three or six credits. Mr. Hinkle. 9 M. T. W. T. F. Pe. 212. Prerequisite: M. L. 101-102 or equivalent.

This course consists of a series of readings and translations of relatively simple French, supplemented by lectures on terminology, vocabulary analysis, and other matters of linguistic technique. The work is designed to meet the needs of students whose interest in the language is primarily that of the acquisition of a reading ability. Since the choice of reading material is adjusted to individual needs, it may be taken by students of varying degrees of previous linguistic training. Daily reports and conferences are required. Students doing a translation project with this course will register for double credit.

### General Courses

**M. L. s411. Masterpieces of German Literature.** Five hours a week. Three credits. Mr. Hinkle. 11 M. T. W. T. F. Pe. 212. Prerequisite: M. L. 316 or equivalent.

This course consists of a study of outstanding literary productions in the various types of German literature, with lectures on the cultural background out of which they have developed. It is designed primarily to meet the needs of teachers and advanced students who wish to supplement their knowledge of their own literature with a survey of similar contributions in the literature of other civilizations. Attention is given to the literary monuments in such a manner as to give a brief outline of German literary development. Daily reports and conferences are required.

### Translation Projects

In connection with the Translation Service of the Modern Language Department an opportunity is given graduate and advanced under-graduate students in the summer session to do a translation project as a means of preparation for a reading knowledge examination in one of the above mentioned languages. Since these translations projects must be done in connection with class work, they are restricted to registrants in the above courses. Students doing such projects are required to register for the same, this registration having the value of a three-credit course, and being in addition to at least one other language course.

### PHYSICAL EDUCATION

**P. E. s101-2-3. Fundamental Activities.** Four hours practice. One credit. Mr. Miller. By arrangement. Gym.

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

**P. E. s201-2-3. 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. s401. Social Recreation.** Five hours a week. 3 credits. Mr. Miller. By arrangement. Gym.

This course is especially prepared to meet demands made of teachers of agriculture to assume leadership in social and recreational activities. The content of the course deals with the organization, supervision and practice work in athletic and social activities for parties, picnics, camps, banquets and similar occasions.

Note: Students in the three weeks' course will interview their adviser in Agricultural Education.

### PHYSICS

**Physics s103, s104. 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. Bartlett. 9 M. T. W. T. F.; 2-4 M. W.; 9-11 M. T. W. T. F.; 2-4 M. T. W. T. D. 209. Prerequisite: Math. 100.

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

**Physics s112, s113. Physics for Engineers.** Four or eight credits. Mr. Derieux. 8 M. T. W. T. F.; 10-1 M. W.; 8-10 M. T. W. T. F.; 10-1 M. W. D. 212.

An advanced treatment of General Physics. First-, second- or third-term 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. D. 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. D. 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. By arrangement. Three credits. Mr. Bartlett. D. 202.

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

**Physics s209. Meteorology.** Three hours credit. Mr. Heck. 11 M. T. W. T. F. D. 113.

Causes of weather change, methods of forecasting, and peculiarities of the weather of North Carolina. Blair, **Weather Elements**.

**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.

#### 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 application of psychology to everyday life.

**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. s368. Measurements in Educational Psychology.** Five hours a week. Three credits. Mr. Garrison. Prerequisite Ed. 203 and six credits in education. 11 M. T. W. T. F. H. 5.

(For a description of course, see Ed. 368.)

## RELIGION

**Rel. s300. Introduction to Religion.** Five hours a week. Three credits.  
Mr. Hicks. 10 M. T. W. T. F. Pe. 204.

Characteristics of the major religious sects of America and a brief survey of recent trends in religious thought.

**Rel. s303. Comparative Religion.** Five hours a week. Three credits.  
Mr. Hicks. 11 M. T. W. T. F. Pe. 204.

Brief history, general characteristics, and social significance of the major living religions of the world.

**Rel. s306. Ethical Problems of Adolescence.** Five hours a week. Three credits.  
Mr. Hicks. 9 M. T. W. T. F. Pe. 204.

A study of typical adjustment problems of modern youth, with special consideration to changing sex standards and the evolution of new values in this connection.

## SOCIOLOGY

**Soc. s202. Introduction to Sociology.** Five hours a week. Three credits.  
Mr. Winston. 8 M. T. W. T. F. Pe. 209.

An introduction to the basic principles underlying social life and the factors connected with it. Identical with the first term of General Sociology.

**Soc. s400. Criminology.** Five hours a week. Three credits. Prerequisite: Soc. 102, supplemented by credits in related fields. Mr. Winston. 9 M. T. W. T. F. Pe. 209.

Causes and conditions leading to crime, methods of handling criminals, and various factors in producing criminal behavior. In the summer term, the special relationship existing between school and other social maladjustments and criminal behavior will be stressed.

**Soc. s404. Educational Sociology.** Five hours a week. Three credits. Prerequisite: 9 term credits in the Social Sciences, including Sociology 202. Mr. Winston. 10 M. T. W. T. F. Pe. 209.

The application of the principles of Sociology to the practical problems of education. Emphasis is placed on the relationship between adjustment processes in the school and in the larger social world.

**Soc. s415. Research in Applied Sociology.** 2 credits. By special arrangement with the instructor, properly qualified students may pursue an individual research problem. Mr. Winston. Pe. 202.

Individual research problems in applied fields of Sociology, such as problems of the family, population problems, social work problems, rural-urban relationships, student success, American leadership.

## SOILS

**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. Pt. 16.

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.

## 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 22 to August 31. 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. s101. Textile Principles Laboratory.** One, two or three credits. Mr. Peeler. By arrangement. Textile Building.

Operation of plain and automatic looms and carding and spinning machines.

**Tex. s102. Yarn Manufacture I.** Five hours a week. Three credits. Mr. Hilton. 10 M. T. W. T. F. 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.** Four hours a week. Two credits. Mr. Lewis. 12 M. T. W. T. 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.** Eight or sixteen hours a week. 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. Peeler. By arrangement. Textile Building.

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



**Tex. s115. Textile Principles.** Five hours a week. Three credits. Mr. Peeler. 10 M. T. W. T. F. Textile Building.

Principles of manufacture involved in the textile industry. Elementary calculations for yarns and fabrics; harness and reed calculations; loom production calculations.

**Tex. s201. Yarn Manufacture II.** Five hours a week. Three credits. Mr. Hilton. 9 M. T. W. T. F. 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.** Ten or twenty hours. Three or six credits. Mr. Hart. 10, 11 M. T. W. T. F.; 2-5 M. T. W. T. F. 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. s208-209. Dobby Weaving Laboratory I or II.** One, two, 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 doobby looms.

**Tex. s301. Yarn Manufacture IV.** Five hours a week. Three credits. Mr. Hilton. 8 M. T. W. T. F. 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. s311. Fabric Analysis.** Six or twelve hours. Two or four credits. Mr. Shinn. 2-5 M. W. or 2-5 T. Th. Textile Building.

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.

**Tex. s313-314. Cotton and Rayon Weaving Laboratory I or II.** One, two, three or six credits. Mr. Hart. By arrangement. Textile Building.

Operation and fixing of doobby, pick and pick, and jacquard looms. Preparation of warps to weave rayon and fine cotton fabrics. Building of box, doobby, and multiplier chains.

**Tex. s320. Leno Design.** Five hours a week. Three credits. Mr. Shinn.  
11 M. T. W. T. F. Textile building. Prerequisite: Fabric Design  
and Analysis, Tex. 205.

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 for dress goods, draperies.

**Tex. s321. Dobby Design.** Five hours a week. Three credits. Mr. Shinn.  
9 M. T. W. T. F. Prerequisite: Fabric Design and Analysis, Tex.  
205. Textile Building.

Designing fabrics, such as fancy crepes, figured double plain, matelasse,  
velvets, corduroys, pique, lines of samples.

### ZOOLOGY

**Zool. s101. General Zoology.** Five recitations, four hours laboratory.  
Four credits. Mr. Harkema. 9 M. T. W. T. F. Laboratory ar-  
ranged. Z. 7.

A study of the structures and function of the vetebrates, with special  
reference to man and the rat.

**Zool. s304. Genetics.** Four credits. Mr. Bostian. By arrangement. Pre-  
requisite: Bot. 101 and 102 or Zool. 101.

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

### Courses for Graduates Only

**Zool. s403. Research in Zoology.** Three credits. Mr. Metcalf, Mr. Mitch-  
ell, 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 UNIVERSITY OF NORTH CAROLINA

## CHAPEL HILL, N. C.

### 1939 SUMMER SESSION

Firm Term: June 8-July 18.

Second Term: July 19-August 26.

The 1939 Summer Session of the University of North Carolina at Chapel Hill offers undergraduate and graduate courses in Archaeology, Art, Astronomy, Botany, Chemistry, Dramatic Art, Economics and Commerce, Education, English, Geology, German, Greek, History, Latin, Law, Library Science, Mathematics, Music, Pharmacy, Physical Education, Physics, Political Science, Psychology, Public Welfare, Romance Languages, Rural Social Economics, Sociology, and Zoology.

Special consideration is to be given during the summer of 1939 to appropriate courses for Superintendents, High School Principals, Elementary Principals, Supervisors, Educational Counselors, and Elementary and Secondary Teachers, and Physical Education Directors.

Courses in practical and industrial arts have been provided for grade teachers and secondary school teachers.

An intensive program in Music Education, including courses in public school music for the elementary school, the high school glee club, band and orchestra work has been arranged.

Practical courses in Physical Education for teachers will be offered through the facilities of the new \$650,000 gymnasium and swimming pool.

A special committee will direct a rich and varied recreational program.

### UNIVERSITY FEES

For Each Term of Six Weeks

Registration Fee	\$12.00
Course Fee Per Quarter Hour Credit	\$ 2.75

Room rent in the University Residence Halls (other than Spencer Hall or the Graduate Clubs) is \$7.50 per term. It is possible for one to eat three well-balanced meals a day in the University Dining Hall Cafeteria at a cost ranging from \$18.00 to \$25.00 per month.

For further information write:

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

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

SIX WEEKS' SESSION: JUNE 7 TO JULY 15, 1939

Plans are now being formulated for a number of the courses to run for nine weeks in order that they may be adjusted to our regular semester basis. *Dates for nine weeks' course will be June 7 to August 5.* It is hoped that the summer school will eventually be a nine weeks term.

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. Placement service without charge.
7. 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

Expenses are as follows for nine weeks:

Fees and charges .....	\$30.00
Board, room, and laundry.....	50.00
	<hr/>
	\$80.00

For further information write:

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

COLLATED

AP 12 '40