

*W. H. ...*

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WEST RALEIGH, N. C.

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West Raleigh, N. C.

THE  
NORTH CAROLINA COLLEGE  
OF  
AGRICULTURE AND MECHANIC ARTS

WEST RALEIGH

1912-1913



RALEIGH  
E. M. UZZELL & Co., STATE PRINTERS AND BINDERS  
1913

# CALENDAR.

1913.							1914.																
<b>JANUARY.</b>							<b>JULY.</b>							<b>JANUARY.</b>									
S.	M.	T.	W.	T.	F.	S.	S.	M.	T.	W.	T.	F.	S.	S.	M.	T.	W.	T.	F.	S.			
--	5	6	7	1	2	3	4	--	6	7	1	2	3	4	5	--	4	5	6	7	1	2	3
12	13	14	15	16	17	18	11	13	14	15	16	17	18	19	12	11	12	13	14	15	16	17	10
19	20	21	22	23	24	25	18	20	21	22	23	24	25	26	19	18	19	20	21	22	23	24	17
26	27	28	29	30	31	--	25	27	28	29	30	31	--	22	25	26	27	28	29	30	31	19	
<b>FEBRUARY.</b>							<b>AUGUST.</b>							<b>FEBRUARY.</b>									
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16	17	18	19	20	21	22	17	24	25	26	27	28	29	30	22	23	24	25	26	27	28		
23	24	25	26	27	28	--	24	31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
<b>MARCH.</b>							<b>SEPTEMBER.</b>							<b>MARCH.</b>									
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23	24	25	26	27	28	29	28	--	--	--	--	--	--	--	29	30	31	--	--	--	--		
30	31	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
<b>APRIL.</b>							<b>OCTOBER.</b>							<b>APRIL.</b>									
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6	7	8	9	10	11	12	5	12	13	14	15	16	17	18	11	12	13	14	15	16	17	18	
13	14	15	16	17	18	19	12	19	20	21	22	23	24	25	19	20	21	22	23	24	25		
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27	28	29	30	--	--	--	26	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
<b>MAY.</b>							<b>NOVEMBER.</b>							<b>MAY.</b>									
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4	5	6	7	8	9	10	2	9	10	11	12	13	14	15	3	4	5	6	7	8	9		
11	12	13	14	15	16	17	9	16	17	18	19	20	21	22	10	11	12	13	14	15	16		
18	19	20	21	22	23	24	16	23	24	25	26	27	28	29	17	18	19	20	21	22	23		
25	26	27	28	29	30	31	23	30	--	--	--	--	--	--	24	25	26	27	28	29	30		
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<b>JUNE.</b>							<b>DECEMBER.</b>							<b>JUNE.</b>									
1	2	3	4	5	6	7	--	1	2	3	4	5	6	--	7	1	2	3	4	5	6		
8	9	10	11	12	13	14	7	7	8	9	10	11	12	13	7	8	9	10	11	12	13		
15	16	17	18	19	20	21	14	14	15	16	17	18	19	20	14	15	16	17	18	19	20		
22	23	24	25	26	27	28	21	21	22	23	24	25	26	27	21	22	23	24	25	26	27		
29	30	--	--	--	--	--	28	28	29	30	31	--	--	--	28	29	30	--	--	--	--	--	



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## COLLEGE CALENDAR.

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### 1913.

Thursday,	July	10.	Entrance examination at each county courthouse, 10 A. M.
Wednesday,	September	3.	Entrance examination at the College, 8:30 A. M.
Wednesday,	September	3.	Examinations to remove conditions.
Thursday,	September	4.	First Term begins; Registration Day.
Thursday,	November	27.	Thanksgiving Day.
Monday,	December	22.	First Term ends.

### 1914.

Wednesday,	January	7.	Second Term begins; Registration Day.
Saturday,	March	14.	Second Term ends.
Monday,	March	16.	Third Term begins.
Sunday,	May	24.	Baccalaureate Sermon.
Monday,	May	25.	Alumni Day. Annual oration.
Tuesday,	May	26.	Commencement Day.

## BOARD OF TRUSTEES.

GOVERNOR LOCKE CRAIG, *ex officio* Chairman.

<i>Name.</i>	<i>Postoffice.</i>	<i>Term Expires.</i>
M. B. STICKLEY.....	Concord .....	March 20, 1915.
T. T. BALLENGER.....	Tryon .....	March 20, 1915.
N. B. BROUGHTON.....	Raleigh .....	March 20, 1915.
O. L. CLARK.....	Clarkton .....	March 20, 1915.
EVERETT THOMPSON.....	Elizabeth City.....	March 20, 1917.
R. H. RICKS.....	Rocky Mount.....	March 20, 1917.
O. MAX GARDNER.....	Shelby .....	March 20, 1917.
M. L. REED.....	Biltmore .....	March 20, 1917.
T. T. THORNE.....	Rocky Mount.....	March 20, 1917.
C. W. GOLD.....	Greensboro .....	March 20, 1919.
T. E. VANN.....	Como .....	March 20, 1919.
D. A. TOMPKINS.....	Charlotte .....	March 20, 1919.
W. E. DANIEL.....	Weldon .....	March 20, 1921.
W. H. RAGAN.....	High Point.....	March 20, 1921.
W. B. COOPER.....	Wilmington .....	March 20, 1921.
J. P. McRAE.....	Laurinburg .....	March 20, 1921.

## EXECUTIVE COMMITTEE.

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R. H. RICKS.

C. W. GOLD, *Secretary.*

M. B. STICKLEY.

N. B. BROUGHTON.

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---

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THOMAS NELSON,

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HOWARD ERNEST SATTERFIELD, M.E.,

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Professor of English, and Dean of College.

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IRA OBED SCHAUB, B.S.,

Professor of Agricultural Extension.

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THOMAS H. TAYLOR,  
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Instructor in Chemistry.

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BENNETT THOMAS SIMMS, D.V.M.,  
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JOHN W. NOWELL, Ph.D.,  
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EDGAR BYRON NICHOLS,  
Instructor in Forge.

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Assistant in Agricultural Extension.

MRS. CHARLES McKIMMON,  
Assistant in Agricultural Extension.

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Registrar.

ARTHUR FINN BOWEN,  
Bursar.

HENRY McKEE TUCKER, M.D.,  
Physician.

ARTHUR BUXTON HURLEY,  
Steward.

WILEY T. CLAY, B.E.,  
Superintendent of Grounds and Buildings.

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MRS. ELLA I. HARRIS,  
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General Secretary of the Young Men's Christian Association.

MISS ISABEL BRONSON BUSBEE,  
Secretary to President.

MISS KATHERINE JOSEPHINE MACKAY,  
Bookkeeper in Bursar's Office.

MISS LUCILE ANDERSON,  
Stenographer, Agricultural Department.

MISS MARY BLEDSOE,  
Stenographer, Engineering Departments.

MISS ELIZABETH GORDAN GRIFFIN,  
Stenographer, Registrar's Office.

STAFF OF NORTH CAROLINA AGRICULTURAL EXPERIMENT  
STATION.\*

DANIEL HARVEY HILL, A.M., LL.D.,  
President.

BENJAMIN WESLEY KILGORE, M.S.,  
Director.

CHARLES BURGESS WILLIAMS, M.S.,  
Vice-Director and Agronomist.

WILLIAM ALPHONSO WITHERS, A.M.,  
Chemist.

GUY ALEXANDER ROBERTS, D.V.S.,  
Veterinarian.

JOSHUA PLUMMER PILLSBURY, B.S.,  
Horticulturist.

HARRY RASCOE FULTON, M.A.,  
Vegetable Pathologist and Bacteriologist.

ZENO PAYNE METCALF, B.A.,  
Entomologist.

ROBERT SETH CURTIS, B.S.,  
Animal Husbandman.

THOMAS H. TAYLOR,  
Poultryman.

LEWIS REINHOLD DETJEN, B.S.A., M.S.,  
Assistant Horticulturist.

J. R. WINSTON, M.S.,  
Assistant in Plant Pathology.

JOSEPH FERGUS BREWSTER, M.A., Ph.D.,  
Assistant Chemist.

RHETT YOUMANS WINTERS, B.S., M.S., Ph.D.,  
Assistant Chemist.

STEPHEN COLE BRUNER, B.S.,  
Special Agent Bureau of Plant Industry,  
Assigned for Coöperative Work in Plant Pathology.

ALEXANDER LITTLEJOHN FEILD, A.B.,  
Assistant Chemist.

ALEXANDER RICHARDSON RUSSELL,  
Assistant in Field Experiments.

ARTHUR FINN BOWEN,  
Bursar.

MISS NELLIE FORT,  
Stenographer.

MISS LOULA V. SHERWOOD,  
Secretary and Stenographer.

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\*By a recent act of the North Carolina Legislature the Station has been authorized to coöperate with the experimental work of the State Department of Agriculture.



## MILITARY ORGANIZATION.

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### Commandant of Cadets.

CAPTAIN WILLIS G. PEACE, United States Army.

### Cadet Major.

T. J. HEWITT.

### Battalion Staff.

T. R. PARRISH, Captain and Adjutant.

R. D. GOODMAN, Captain and Quartermaster.

### Noncommissioned Staff.

D. W. THORP, Sergeant-Major.

J. F. HUETTE, Quartermaster Sergeant and Color Sergeant.

T. L. BAYNE, JR., Chief Trumpeter.

### Band.

W. C. HOPKINS, Captain.

H. L. JOSLYN, First Lieutenant.

W. C. TAYLOR, Drum Major.

J. F. SCHENCK, First Sergeant.

W. L. JEWELL, Sergeant.

W. V. PEARSALL, Sergeant.

W. D. LEWIS, Sergeant.

E. L. CLOYD, Sergeant.

I. T. LEWIS, Corporal.

R. CROWDER, Corporal.

### Company A.

F. S. HALES, Captain.

J. J. PHILLIPS, First Lieutenant.

E. C. LATHAM, Second Lieutenant.

R. S. MAUNEY, Second Lieutenant.

J. HARVEY, JR., First Sergeant.

E. H. WEATHERSPOON, Sergeant.

E. C. BLAIR, Sergeant.

R. A. GILL, Sergeant.

J. M. ROBERTS, Sergeant.

R. O. CALDWELL, Sergeant.

B. W. SETZER, Corporal.  
R. G. PARLIER, Corporal.  
S. E. JENNET, Corporal.  
G. V. BAUM, Corporal.  
J. H. HADDOCK, Corporal.  
R. A. MALLOY, Corporal.  
R. W. HAMILTON, Corporal.  
J. S. HOWARD, Corporal.

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W. H. PARKER, Captain.  
W. R. CLEMENTS, First Lieutenant.  
L. L. DAIL, Second Lieutenant.  
S. J. COX, First Sergeant.  
O. Z. WRENN, Sergeant.  
I. R. CRANE, Sergeant.  
E. W. WALDROUP, Sergeant.  
L. JOHN, Sergeant.  
L. W. GARDNER, Corporal.  
W. H. GASKILL, Corporal.  
C. H. WADSWORTH, Corporal.  
G. H. NASH, Corporal.  
R. M. CALDWELL, Corporal.  
L. G. CHERRY, Corporal.  
B. M. BLOUNT, Corporal.  
R. A. JONES, Corporal.

**Company C.**

H. B. BRIGGS, Captain.  
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J. O. RANKIN, Second Lieutenant.  
D. D. COX, First Sergeant.  
D. E. ROBERTS, Sergeant.  
H. K. NASH, Sergeant.  
D. M. TATE, Sergeant.  
J. E. McNEELY, Sergeant.  
M. V. PERRY, Sergeant.  
V. R. HERMON, Corporal.  
H. K. WITHERSPOON, Corporal.  
W. S. HAYWOOD, Corporal.  
C. P. ELDRIDGE, Corporal.  
F. C. JONES, Corporal.

J. F. HARRIS, Corporal.  
W. F. KILPATRICK, Corporal.

**Company D.**

G. L. BAIN, Captain.  
H. A. QUICKEL, First Lieutenant.  
T. R. HART, Second Lieutenant.  
J. R. BUCHANAN, First Sergeant.  
W. T. SHAW, Sergeant.  
D. A. LEARD, Sergeant.  
C. R. BAILEY, Sergeant.  
J. G. H. GEITNER, Sergeant.  
J. F. SMITH, Sergeant.  
E. P. ROUSE, Sergeant.  
W. L. MOODY, Sergeant.  
E. L. COBLE, Sergeant.  
R. H. FEILD, Corporal.  
R. BROOKS, Corporal.  
L. C. ATKISSON, Corporal.  
H. SPENCER, Corporal.  
H. B. CONSTABLE, Corporal.  
G. G. HENDRICKS, Corporal.  
W. I. SMITH, Corporal.

**Company E.**

E. J. JEFFRESS, Captain.  
R. T. MELVIN, First Lieutenant.  
W. T. NIXON, Second Lieutenant.  
J. B. REES, First Sergeant.  
K. M. FETZER, Sergeant.  
F. B. MORTON, Sergeant.  
W. H. SMITH, Sergeant.  
J. W. ROSS, Sergeant.  
H. C. MCPHAIL, Sergeant.  
H. M. HARSIIAW, Sergeant.  
D. L. HOOPER, Corporal.  
T. J. MOODY, Corporal.  
B. WHITE, Corporal.  
W. J. SMITH, Corporal.  
L. P. DENMARK, Corporal.  
R. A. PAGE, Corporal.  
G. L. JEFFERS, Corporal.  
G. W. COMMANDER, Corporal.

**Company F.**

G. T. ROWLAND, Captain.  
A. C. WILSON, First Lieutenant.  
F. W. McCOMB, Second Lieutenant.  
J. FONTAINE, First Sergeant.  
H. V. BIBERSTEIN, Sergeant.  
V. W. BREEZE, Sergeant.  
B. O. AUSTIN, Sergeant.  
H. BURLESON, Sergeant.  
J. R. TOWNSEND, Sergeant.  
F. K. KRAMER, Corporal.  
D. R. HOLT, Corporal.  
L. A. DOUB, Corporal.  
J. H. HALL, Corporal.  
E. L. COTTON, Corporal.  
R. T. NEWCOMB, Corporal.  
J. G. PINNER, Corporal.  
R. P. HARRIS, Corporal.  
P. E. SNEAD, Corporal.

## GENERAL INFORMATION.

During the years in which North Carolina was emerging from the economic havoc wrought by Civil War and Reconstruction, some farsighted men began to see the necessity of rearing industrially equipped men. They felt keenly the need of competent men to build and direct new industries, and to restore the land which had been impoverished partly by slave labor. They recognized that men capable of doing what was needed would have to be educated in industrial schools and technical colleges.

The first organized body to take steps for the establishment of a State industrial institution in North Carolina was the Watauga Club. This club, composed of bright young men, explained its mission by declaring that it was "an association in the city of Raleigh designed to find out and make known information on practical subjects that will be of public use." In 1885 this club presented to the Legislature a memorial urging that body "to establish an industrial school in North Carolina which shall be a training place for young men who wish to acquire skill in the wealth-producing arts and sciences."

This memorial quickened general interest in the proposed school, and several bills looking to its foundation were introduced in the Legislature of 1885. On March 7th, one of these bills, introduced by Hon. Augustus Leazar of Iredell County, became a law. This law provided that the Board of Agriculture should seek proposals from the cities and towns of the State, and that the school should be placed in the town offering the most inducements. The Board of Agriculture finally accepted an offer from the city of Raleigh.

Meantime, the ideas of the advocates of the school had been somewhat broadened as to the character of the proposed institution.

These men saw that Congress was about to supplement the original land grant by an additional appropriation for agricultural and mechanical colleges in each State. The originators of the conception then sought the aid of progressive farmers in order to change the school into an Agricultural and Mechanical College. Col. L. L. Polk, the editor of the newly-established *Progressive Farmer*, threw the weight of his paper heartily into the idea. Meetings were held in various places, and two very large meetings in Raleigh considered the proposition. As a result, the school already provided for was by action of the Legislature of 1887 changed into an Agricultural and Mechanical College, and the Land Scrip Fund was given the

newly formed institution. In addition, the law directed that any surplus from the Department of Agriculture should go into the treasury of the college. Mr. R. Stanhope Pullen, one of Raleigh's most broad-minded citizens, gave the institution eighty-three acres of land in a beautiful suburb of Raleigh. Additional funds were afterwards provided by the Supplemental Morrill Bill passed by Congress in 1890, by the Nelson Bill of 1907, and by State appropriations. The first building was completed in 1889, and the doors of the College were opened for students in October, 1889. Seventy-two students, representing thirty-seven counties, were enrolled the first year. The faculty consisted of six full professors and two assistants.

From this small beginning in 1889, the College has grown to be the second in size in students and faculty among the colleges for men in the State.

The College is beautifully located on the extension of Hillsboro Street in the western suburbs of Raleigh, a mile and a quarter from the State Capitol. The site is suitable in all respects.

There is an abundant supply of water from the city mains and from twelve deep wells on the College grounds. The water is analyzed, both chemically and bacteriologically, at regular periods.

The College now owns four hundred and eighty-five acres of land. Fifteen hundred young trees and nine hundred and forty vines are growing in an orchard of twenty-five acres. Seven acres are devoted to truck growing. The campus consists of about thirty acres of rolling land, which is being improved as rapidly as circumstances permit.

#### BUILDINGS.

The buildings, numbering twenty-six in all, are grouped as follows: the academic buildings; the social life buildings; and the farm buildings.

1. The academic buildings are as follows:

1. **Holladay Hall.**—This, the administration building of the College, is of brick with brown stone trimmings. It is 170 feet long by 64 feet deep; part of the building is four stories and the remainder two. The first floor is devoted to the lecture-rooms and laboratories of the Physics Department. The second floor contains the offices of the President, the Dean of the Faculty, the Commandant, Registrar, and the Bursar. In addition, six lecture-rooms are located on this floor. The upper stories are used by students.

2. **Patterson Hall.**—This is the largest of the Agricultural buildings. It is a three-story buff press-brick structure, with granite trim-

mings, and is 204 feet long by 74 deep. The basement floor contains a very commodious dairy with wash-rooms and sterilization chamber. It also contains mailing rooms for bulletins. The second floor provides room for the offices of the Experiment Station, for offices, lecture-rooms, and laboratories for the departments of Agronomy, Horticulture, Soils, and Agricultural Extension. On the third floor are the rooms devoted to the offices, lecture-rooms, and laboratories of the departments of Botany and Plant Pathology, and of Physiology and Veterinary Medicine. This building contains excellently equipped laboratories, and is well lighted and ventilated. Each section of the building was designed for its specific function and hence admirably meets the requirements of these departments.

**3. Animal Husbandry Building.**—This is a three-story brick structure, and has white brick and cement trimmings. One-half of the first floor is given to the Poultry Department. The other half is devoted to a stock-judging room. The offices, lecture-rooms, and laboratories of the Animal Husbandry Department take up all the second floor. The third floor is assigned to the Department of Entomology and Zoölogy. In addition to offices and laboratories, this floor contains a photographic room and a museum.

**4. Winston Hall.**—This is the Civil and Electrical Engineering building. It is built of brick, with reinforced concrete floors, three stories high, including the basement. It consists of a main section, 104 by 58 feet, with two wings each 91 by 32 feet. The basement contains the laboratories and instrument rooms of the departments of Electrical and Civil Engineering. The main floor has the lecture, recitation, and drafting rooms, and the offices of the same two departments. The second floor contains the lecture and recitation rooms and the laboratories and offices of the Department of Chemistry and the Chemical Department of the State Experiment Station.

**5. Mechanical Engineering Building and Machine Shops.**—A plain, substantial, two-story brick building furnishes room for the machine shop, the wood shop, the forge shop, the tool-room of the Mechanical Department. In the same building are housed the mechanical laboratory, the drawing-rooms, lecture-rooms, and offices of this department.

**6. Textile Building.**—This is a two-story brick building 125 by 75 feet, with a basement. Its construction is similar to a cotton mill, and is an illustration of standard construction in this class of buildings. The basement contains the dyeing department, the first floor the looms and warp preparation machinery, and the second floor the carding and spinning machinery.

7. **Primrose Hall.**—Built originally for the Horticultural Department, this building, one story and basement, will hereafter be used for class-rooms.

8. **Central Power Plant.**—Heat, light, and power for all the College buildings are furnished from this central station. The boiler plant consists of two 75-horse-power Babcock and Wilcox boilers and two 100-horse-power Atlas Water-tube boilers, with a working steam pressure of 150 pounds. The engine plant embraces a 100-horse-power Skinner engine and a Crocker-Wheeler generator attached; a 100 k. w. DeLaval turbine generator set with exciter; and steam and vacuum pumps for feeding the boilers and maintaining circulation in steam-heating apparatus. The buildings are equipped with Warren-Webster system of heating.

9. **Foundry.**—Until the new shop building is completed, the foundry is located in the rear section of Pullen Hall. The equipment consists of a 36-inch cupola furnace, a Griffin oil furnace for melting iron; another for brass, and a small crucible furnace for brass melting; a core oven, and benches and hand tools for moulding in the course of exercises, as well as for any repair work required by the College.

**The Fire Protection** of the College consists of the following equipment: A standpipe and reservoir, hose and hose reels. Hydrants are conveniently located about the grounds, with attached hose nozzles, etc. The buildings are supplied with chemical extinguishers.

II. The social life buildings are as follows:

1. **Pullen Hall.**—The basement of this large three-story colonial brick building is used as an armory. The first floor gives quarters for a splendidly lighted reading-room and library and two lecture-rooms. The second story serves as the College auditorium and seats about one thousand people.

2. **Dining Hall.**—This building, which will seat seven hundred and fifty students, is 144 feet by 54 feet. It is trimmed with Indiana limestone and white brick. Attached to this dining hall is a large kitchen which is supplied with a complete modern outfit of kitchen conveniences and utensils. Serving rooms, storerooms, preparation rooms, and every needful adjunct have been provided.

3. **The Y. M. C. A. Building.**—The Young Men's Christian Association Building, which was opened January 31, 1913, is a three-story red brick building with Indiana limestone trimming. This building is the home of all the voluntary student activities, and is under the supervision of the Young Men's Christian Association. The basement floor contains a small gymnasium, bowling alleys, a locker-room, shower baths, toilets, swimming pool, and athletic rooms. The main floor contains a large lobby, a reading-room well equipped with



daily papers and magazines, a game room, an auditorium, a banquet hall with pantry and kitchen attached, a committee room, a library, a kodak dark-room, four bedrooms for visitors, offices for the College weekly, monthly and annual publications and offices for the Association. The third floor contains two large literary society halls, a cabinet room, a Bible study, and a Mission study room. The building is handsomely equipped with mission furniture throughout.

4. **Infirmary.**—This is a two-story brick building, containing a sitting-room, seven bedrooms, three bathrooms, a kitchen, linen-room, the College Physician's office, and a medicine chest. The rooms are well-ventilated, well-lighted, and heated by steam. Each room opens upon a large, pleasant portico. The furnishing and equipment of the rooms are such as are used in modern hospitals.

5. **Watauga Dormitory.**—Rooms for one hundred and thirty students are provided by this three-story brick dormitory. A large bathroom is located in the basement of this building.

6. **Nineteen-Eleven Dormitory.**—This is the largest and most complete dormitory on the grounds. It is divided into sections by fire-proof walls, and each section is practically a separate house. It furnishes rooms for two hundred and forty students. Large and convenient bathrooms are located in the basement of the building.

7. **First Dormitory.**—This two-story brick dormitory has ten rooms and affords accommodations for twenty students.

8. **Second Dormitory.**—Built on the same plan as the First Dormitory, this building affords a college home for twenty students.

9. **Third Dormitory.**—Twenty students also find rooms in this small dormitory.

10. **Fourth Dormitory.**—This is a three-story, mansard-roofed brick structure, and furnishes rooms for forty-eight students.

III. The farm buildings constitute the third group of College buildings. These are as follows:

1. A large sanitary dairy barn with stalls and feed-rooms for fifty cows. This barn is abundantly aired and lighted, is equipped with James sanitary fixtures, and has cement floors.

2. A barn for the work stock. Stalls for most of the work animals and some overhead storage are supplied by this barn.

3. A storage barn. This barn gives storage for feedstuffs for the dairy and is also equipped with stalls for the Percheron horses.

4. A fertilizer and implement barn. A commodious barn, which provides room for instruction in mixing fertilizers and storage for the farm implements and machines.

5. The Experiment Station barn. This convenient building is located on the College farm and houses the work stock of the Station.

6. A calf barn. The young stock of the College are provided with separate stalls and feeding rooms in a comfortable building on the farm site.

7. The foreman's home. A cottage near the barns is occupied by the foreman of the College farm and by the herdsman.

8. The Horticulturist's home. In order that he may be near his work, the Horticulturist is provided with a home in the center of the orchard.

9. The Poultry Plant, consisting of the home of the instructor in charge, incubator, and brooding house, pens for all the fowls, is situated just opposite the Horticultural farm, on Hillsboro Road.

#### THE AGRICULTURAL EXPERIMENT STATION.

The North Carolina Agricultural Experiment Station was established originally as a division of the State Department of Agriculture in accordance with an act of the General Assembly ratified March 12, 1887. Its work was greatly promoted by act of Congress of March 2, 1887, known as the Hatch Act, which made a donation to each State for the purpose of investigations in agriculture and for publishing the same. The funds of the Experiment Station were further supplemented by the act of Congress of March 16, 1906, known as the Adams Act. Under the requirements of the Hatch Act, the Station became a department of the College and was conducted jointly by the College and the Department of Agriculture from 1887 to 1907, with the exception of three years. Under an agreement entered into between the Board of Trustees of the College and the Board of Agriculture in January, 1912, and authorized by act of the Legislature of 1913, the work of the Experiment Station, which covers all of the experimental work in agriculture in the State, is jointly conducted and supported by the College and State Department of Agriculture.

The experimental work in the field in agriculture, horticulture, stock and poultry raising, dairying, etc., is conducted on the College farm and on the test farms of the Department of Agriculture in different parts of the State, and the laboratory investigations are conducted in the laboratories in the two institutions.

The Station is always glad to welcome visitors and to show them the work in progress. The Station conducts a large correspondence with farmers and others concerning agricultural matters. It takes pleasure in receiving and answering questions.

Bulletins relating to general farm matters, embodying the results of the experiments, are sent free to all citizens of the State who request them. A request addressed to Agricultural Experiment Station, West Raleigh, will bring these publications in answer to letters.

### THE PURPOSE OF THE COLLEGE.

The College is an institution where young men of character, energy, and ambition may fit themselves for useful and honorable work in many lines of industry in which training and skill are requisite to success. It is intended to train farmers, mechanics, engineers, architects, draughtsmen, machinists, electricians, miners, metallurgists, chemists, dyers, mill workers, manufacturers, stock raisers, fruit growers, truckers, and dairymen, by giving them not only a liberal, but also a special education, with such manual and technical training as will qualify them for their future work.

It offers practical and technical education in Agriculture, Horticulture, Animal Industry, Civil Engineering, Mechanical Engineering, Electrical Engineering, Mining Engineering, Chemistry, Dyeing, Textile Industry, and Agriculture. It also offers practical training in Carpentry, Woodturning, Blacksmithing, Machinist's work, Mill work, Boiler tending, Engine tending, Dynamo tending and Installation, Electric-light Wiring, Armature Winding, and other subjects relating to practical electricity.

Although the leading purpose of the College is to furnish technical and practical instruction, yet other subjects essential to a liberal education are not omitted. Thorough instruction is given in English, Mathematics, Political Economy, Physics, Chemistry, Botany, Zoölogy, Physiology, and Geology.

The College is not a place for young men who desire merely a general education without manual or technical training, nor for lads lacking in physical development, mental capacity, or moral fiber, nor for those who are unable or unwilling to observe regularity, system, and order in their daily work.

### WHAT THE COLLEGE EXPECTS OF ITS STUDENTS.

The College does not have many rules. It expects that its students will live rightly for their own sakes and for the sake of the State that is educating them. The fundamental law of the College is this: Always and everywhere, be a gentleman.

A record is kept of every student. If it is apparent from this record that a student is not studying or that his conduct is not meeting the requirements of the College, such student will be required to withdraw. Scandalous, vicious, or immoral conduct will necessitate an immediate dismissal.

Students attend this College, of course, to fit themselves for a technical business life. They are therefore expected to be business-like in their habits; to be prompt in their attendance and regular at

chapel, classes, shops, drills, inspections, and all other duties. To prepare themselves for their daily work, students are expected to observe in their own rooms the regular morning and evening hours of study and to be absent from College only at the regularly specified periods. These periods are as follows: For Juniors, Friday, Saturday, and Sunday nights; for Sophomores, Saturday and Sunday nights; for Freshmen, Sunday nights. Saturday and Sunday afternoons are liberty afternoons.

Students are expected to keep their rooms neat and sanitary; to refrain from disturbing one another by noise in the buildings or on the grounds—in short, to conduct themselves in their College home with the same courtesy, self-respect, and propriety that they do in their own homes.

Visiting poolrooms, leaving College after 11 o'clock at night, continued cigarette smoking, willful destruction of College property, drinking, immorality, gambling in all forms, hazing of any kind, disrespect to members of the Faculty or officers of the College, any conduct unbecoming a gentleman—these offenses it is expected that a student's self-respect will lead him to abstain from, and should any student be found guilty of them he will be excluded from College.

#### REPORTS AND SCHOLARSHIP.

Regular reports of scholarship and conduct are sent to parents and guardians at the end of each term. Special reports are made whenever necessary. Students who are persistently neglectful of duty, or manifestly unable to do the work required, will be discharged at any time. The Faculty will require any student to withdraw whenever it is plain that his stay in the institution is not profitable to himself nor to the College.

#### PRIZES.

The North Carolina State Fair Association offers a prize of \$5 to the student preparing the best essay on the Live-stock Exhibit at the State Fair.

A gold medal is awarded to the Senior speaker who makes the best oration on Commencement Day.

The National Association of Cotton Manufacturers offers annually a medal to the student in the Textile Department who has the highest proficiency in his work.

#### RELIGIOUS INFLUENCES.

All students are required to attend chapel exercises in Pullen Auditorium each morning. These services are conducted by the President, by some member of the Faculty, or by some visiting minister or layman.

Each student is expected to attend religious service in Raleigh on Sunday morning at the church of his choice. The students are always welcomed in the Sabbath schools of Raleigh, and a large number of them attend these services.

#### THE YOUNG MEN'S CHRISTIAN ASSOCIATION.

The Young Men's Christian Association is a voluntary organization among the students for the purpose of centralizing and directing the moral and religious life of the student body. The work is under the direction of a General Secretary, who is employed to give his entire time to the work, and of the following student officers: president, vice president, corresponding and recording secretaries, and treasurer. Active assistance is also given by an Advisory Committee, which includes three members of the Faculty and six prominent business men in Raleigh. The president and treasurer of the Association are *ex officio* members of this committee.

Membership is open to all College students of good moral character. Only members of evangelical churches may become active members.

A hand-book, giving general information about the College, is published each spring and sent to prospective students with a personal letter of welcome from the officers of the Association.

A large number of men are trained each year in active Christian service through membership on the following standing committees, all of which are trained by the General Secretary in their particular work: Bible Study Committee, which has charge of the organization of voluntary Bible Study classes among the students, and in this way seeks to reach all of the non-Christian element of the student body; Religious Meetings Committee, which provides speakers and arranges programs for the weekly meetings of the Association; Mission Study Committee, which provides for Mission Study among the students; Membership Committee, which seeks to enlist students as members of the Young Men's Christian Association; Social Committee, which provides means of social entertainment and diversion; Employment Bureau, which seeks to help men find employment while in College; and Finance Committee. Each committee is held responsible for its part of the Association activities.

The Association is supported by gifts from the Board of Trustees, the Faculty, and citizens of the State, and by its regular membership fees. Although membership is voluntary, it is desired that all students should apply for membership and thereby align themselves with an organization which will assist them in leading an upright life while in college.

The Association occupies its own building on the campus, which was erected at a cost of \$41,000.

Parents or students wishing to obtain further information about the work of the Association, may do so by addressing the General Secretary, West Raleigh, N. C.

#### ATHLETICS.

The **Athletic Association** is organized by the student body to promote physical health and manly spirit through athletic sports. Under the direction of the Athletic Committee of the Faculty, it promotes practice in baseball, basketball, football, track athletics, etc. The Association employs a director who devotes all his time to the interests of this department.

The **Athletic Park** is situated in the center of the College buildings. It is provided with a grandstand and uncovered seats, and meets amply the needs of the various athletic teams.

#### LIBRARY AND READING-ROOMS.

The **College Library** occupies the first story of Pullen Hall. The reading-room is supplied regularly with about one hundred and fifty magazines and journals of various kinds, and yearly additions are being made to this number. The library contains about seven thousand five hundred volumes. There are also reference libraries in the different departments. The library is kept open from 9 a. m. to 6 p. m. The Librarian is always present to assist students in finding desired information.

The **Olivia Raney Library** in Raleigh, containing now about eleven thousand five hundred volumes, is free to the students, and they have the privilege of borrowing books from it.

Students are also allowed to consult books in the **State Library**.

#### STATE MUSEUM.

Students have free access to the large collections of the State Museum. These collections furnish most excellent opportunities for studies in Geology, Mineralogy, Mining, Forestry, and Natural History.

#### COLLEGE SOCIETIES.

Such college organizations are encouraged as tend to form good character, to develop manly physical vigor, and to promote literary, scientific, and technical research and training.

The **Biag Society** is composed of those students who have made the best record in biological and agricultural subjects. The member-

ship is limited to twelve. The society meets monthly for the discussion of biological and agricultural questions.

**Farmers' Progressive Association.**—The students in the Winter Course in Agriculture meet every Wednesday night during the winter term for a discussion of practical problems. The meetings are conducted in the manner of a Farmers' Institute, and give training in conducting farmers' meetings, in *ex tempore* speaking on agricultural questions, and in the writing and reading of reports on various farm operations.

**The Rural Science Club** meets semimonthly for the discussion of agricultural subjects, review of current agricultural publications, and reports on personal experiments and the work of the College farm and Experiment Station.

**The Biological Club** meets semimonthly for the discussion of biological subjects in their relation to practical agriculture. Students here present results of their own investigations and observations and reviews of the more important current publications, particularly those from the United States Department of Agriculture and the State Experiment Stations.

**The Tompkins Textile Society.**—The purpose of this society is to discuss textile problems and other subjects in connection with the textile industry. Meetings are held fortnightly, and great interest is taken in them by the textile students.

**The Mechanical Engineering Society** meets every week for the discussion of engineering subjects. The society is composed of Seniors and Juniors taking the Mechanical Engineering Course. Its work has proved very beneficial to its members.

**Electrical Engineering Society.**—A student branch of the American Institute of Electrical Engineers was organized at the College several years ago. It holds weekly meetings for the reading and discussion of papers. At convenient intervals the society makes trips for inspecting interesting electrical installations. From time to time addresses are made by visiting engineers.

**Berzellius Society** meets fortnightly for discussion of chemical topics, and reporting upon the leading articles in the chemical journals.

**The Vorwaerts Verein (Forward Society)** is a society for the promotion of interest in the study of German. Weekly meetings are held at which literary programs are carried out in German, giving its members practice in expressing themselves in that language. Membership is open to students and members of the Faculty who have acquired sufficient knowledge to understand simple conversation in German.

The Pullen and Leazar Literary Societies afford excellent opportunities for practice in declamation, debate, composition, and parliamentary law, as well as opportunities for social pleasure and recreation.

The Alumni Association meets each year on the Monday preceding Commencement Day, transacts its annual business, hears the Alumni oration, and attends the annual Alumni banquet. This association purposes raising funds to erect an Alumni building at the College.

#### REQUISITES FOR ADMISSION.

Each applicant for admission must be at least sixteen years of age and must bring a certificate of good moral character from the school last attended.

#### To the Four-year Courses.

Admission to the Freshman Class of all four-year courses is by the unit system. A unit is defined as a subject pursued in schools of approved grade for five periods a week throughout a year, each period being at least forty-five minutes in length. Each applicant, selecting from the subjects named in the lists below, must, on examination, make eight units, the credit on any one subject not to exceed the value indicated. The following units are required for all four-year courses:

SUBJECT.	UNITS.
Algebra.....	1½
English.....	2
United States History.....	1
Total units in required subjects.....	4½
Geometry (Engineering Courses and Chemistry).	

The 1½ units required in Algebra must cover the subject to quadratic equations.

Of the 2 units required in English, 1 unit must be in grammar and composition and 1 unit in literature.

A full unit will be allowed for any one science only when the subject has been given with laboratory practice.

In addition to the four and one-half units in required subjects given in above list, applicants wishing to take the Agricultural Course, the Veterinary Course, or the Textile Course must offer three and a half units selected from the list below. Applicants wishing to enter



make their sons for contingencies and spending money, it is suggested, should be kept small; for small allowances frequently take away temptation to unwise living.

#### DETAILED INFORMATION.

The largest payment is made in September. On entrance, a Freshman student will need \$85 to meet all of his various payments for the first month. But of this amount, the payment \$22.50 for tuition may be deferred, if desired, to the first of November. This will reduce the first, or entrance, payment to \$62.50. This amount includes payment to the College of \$45 (this may vary one or two dollars according to the course of instruction); deposit with the dealer for uniform and cap of \$5, and \$12.50 for the purchase of books and incidentals. In the case of day students, or students rooming and boarding out of College, tuition will be paid on entrance.

Board is \$11 per month, payable in advance on the first day of each calendar month from September through to May. Board for less time than one month is charged for at the rate of 50 cents a day, or \$3 per week. Refunds for board will be made on the basis of these charges.

Students withdrawing from College within two weeks from date of entrance will be refunded all money paid by them to the College Bursar except charges for board and lodging during the time they are in College. In special cases the right is reserved to modify or entirely to revoke this rule.

Refunds to students withdrawing later than two weeks from date of entrance will be made in proportion to the length of time they are in College. The right in special cases to modify or to revoke this rule is reserved.

#### EXPENSE BY MONTHS.

The following is a statement of the College expenses of a Freshman student by months, for Civil, Electrical, and Mechanical Engineering divisions:

SEPTEMBER: Room rent, fuel and lights, \$15; incidental fee, \$2; medical and hospital fee, \$3; lecture fee, \$1; library fee, \$1; furniture fee, \$1; physical culture fee, \$3; military equipment deposit, \$5; mechanical and physical laboratory fees, \$3; board for September, \$11; a total of \$45 to be paid to the College. Tuition for one-half session, \$22.50, may be paid at this time, which will make a total of \$67.50 to be paid to the College. In addition, there is required by the merchant a deposit of \$5 for uniform and cap when the measure of the student is taken; and about \$10 to \$15 is required to buy books, drawing instruments, and for incidentals.

An Agricultural Freshman pays \$1.50 more than the above. A Textile Freshman pays \$1 less than the above. Chemical Freshmen pay \$1 more than the above.

OCTOBER: Board, \$11, and balance to merchant for uniform and cap, \$15.

NOVEMBER: Board, \$11; tuition, if it was not paid in September, \$22.50.

DECEMBER: Board, \$11.

JANUARY: Tuition, \$22.50; lodging and fuel and lights, \$15; medical and hospital fee, \$3; furniture fee, \$1; physical culture fee, \$3; board, \$11. A total of \$55.50.

FEBRUARY: Board, \$11.

MARCH: Board, \$11.

APRIL: Board, \$11.

MAY: Board, \$11.

The amount of the September or entrance payment for students varies slightly with the class, the course, and the division. This variation is caused by the additional collection of fees and deposits for laboratory work and for supplies. The amount of these fees and deposits is given in the table below, for all classes and courses.

	Seniors.	Juniors.	Sophomores.	Freshmen.	2d Year of Two-Year Short Course.	1st Year of Two-Year Short Course.	One-Year Short Course.
Students in Agriculture—							
Agronomy Division.....	\$ 2.00	\$11.00	\$10.50	\$ 4.50	\$....	\$....	\$....
Animal Husbandry Division.....	1.00	10.00	10.50	4.50	.....	.....	.....
Horticulture Division.....	4.00	11.00	10.50	4.50	.....	.....	.....
Normal Division.....	1.00	11.00	10.50	4.50	.....	.....	.....
Veterinary Division.....	8.00	17.00	10.50	4.50	.....	.....	.....
Short Courses.....	.....	.....	.....	.....	8.00	2.00	8.00
Students in Civil Engineering.....	1.00	1.00	4.00	3.00	.....	.....	.....
Students in Mechanical Engineering....	2.00	3.00	6.00	3.00	2.00	2.00	2.00
Students in Electrical Engineering....	2.00	4.00	6.00	3.00	.....	.....	.....
Students in Chemistry.....	14.00	16.00	7.00	4.00	.....	.....	.....
Students in Textile Industry.....	8.00	8.00	8.00	2.00	4.00	4.00	5.00

NOTE.—The College Bursar is forbidden by the Trustees to give credit.

All unused deposits are refunded to the student at the end of the session or upon his withdrawal from College. If he has overdrawn his deposit, he is required to pay the amount of the overdraft.

If the student has a scholarship, he does not pay tuition.

Students entering after September will pay on entrance all the items enumerated under "September," less a credit in part for tuition and room rent.

#### ROOM FURNITURE.

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

Overcoats may be brought from home or purchased in the city.

#### FREE TUITION.

Scholarships, one hundred and twenty in number, conferring free tuition, are given to needy young men of talent and character. As far as possible, these scholarships are distributed among the counties of the State. Appointments are made only by the President of the College upon written recommendation of members of the Legislature. The scholarships are not intended for people who have property. Certificates of inability to pay must be made by the applicant and endorsed by the person recommending him.

The Southern Railway Company offers four scholarships which pay \$75 each a year. Applicants for these scholarships must comply with certain conditions as to locality, entrance examinations, and work after graduation. The College Registrar will send a copy of these conditions on application.

#### SELF-HELP.

Some students who are alert and energetic frequently earn part of their expenses in College. Some of the agricultural students find work at odd hours on the farm, in the orchard, in the barn, in the dairy. Some students act as agents for laundries, for furnishing-houses, for pressing clubs. The College employs a few students for the dining-room and for other purposes. A student's ability to support himself will depend largely on his own power to find work and to hold it after he finds it. It must, however, be remembered that the duties of the classroom take most of a student's time, and his hours for remunerative work are therefore limited.

**STUDENT LOAN FUND.**

The Alumni Association of the College has established a small fund to be lent to needy students of talent and character. The loans are made at 6 per cent, and good security is required. Sufficient time for repayment is given to enable the student to earn the money himself. The amount lent to each student is limited. The purpose is to help young men who are willing to help themselves and who cannot find sufficient employment while in college to meet all their necessary expenses.

Contributions are solicited for this fund from students, alumni, and friends of education generally. The fund is administered by the College Bursar, under the direction of the President. At present the fund amounts to \$4,500.

**BOARD AND LODGING.**

All students are expected to board in the College dining hall or in approved boarding-houses near the College, and to room in the College dormitories. An abundant supply of plain, nourishing food, with as large a variety as possible, is furnished absolutely at cost. The charge at present is \$11 per month, payable in advance.

Rooms in the College dormitories are supplied with electric lights, steam heat, and all necessary furniture, except sheets, blankets, pillow-cases, pillows, bedspreads, and towels, which each student must furnish for himself. The charge for lodging is by the month, and there is no reduction in case of withdrawal.

**DRILL.**

In return for the Morrill Fund of the United States Government, the College is under contract to require its students to drill at least three times each week, and an Army officer is detailed to conduct the drills. No student will be excused from drill unless the College Physician, after examination, deems him unfit for military duty.

**UNIFORM.**

The College uniform must be worn by all students when they are on military duty. It must be bought at the College from the regular contractor. The uniform is of strong gray cloth and with proper care should last two or three years.

**CARE OF THE SICK.**

Every effort is made to protect the health of young men in the College. Regular inspections of the entire institution are made once a year, or oftener, by the State Board of Health. Similar inspections are made monthly by the College Physician.

Each student has a regular routine of daily life, including abundant physical exercise in the shops and on the drill grounds.

In case of sickness, a student is taken immediately to the College Infirmary, where he receives medical attention and careful nursing.

The College Physician visits the Infirmary daily at 3 o'clock p. m., and in cases of serious illness as frequently as may be required.

A trained nurse has charge of the Infirmary at all times.

**VACCINATION.**

By direction of the Trustees, no young man will be registered unless he has been successfully vaccinated within the past two years. The College greatly prefers that all applicants for admission should be vaccinated at home, and that a certificate of successful vaccination within the past two years be brought from the family physician. In case this cannot be done, the College Physician will vaccinate applicants before they are registered at the College. A blank form to be filled by the home physician will be mailed on application. It will save a great deal of time and trouble, therefore, to be vaccinated before applying for registration. In this way applicants will avoid the inconvenience and discomfort resulting from vaccination while at College. The size of scar resulting from a previous vaccination is not proof that revaccination is not needed.

## COURSES OF INSTRUCTION.

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The College offers courses of instruction in the following subjects:

### I. Agriculture.

(a) **Four-year course** including Agronomy, Soils, and Drainage, and Agricultural Chemistry; Animal Husbandry, Dairying, and Poultry Husbandry; Horticulture and Botany; Veterinary Science; Normal Course.

(b) **Course in Veterinary Medicine.**

(c) **Two-year Course in Agriculture.**

(e) **Six-weeks Course in Agriculture and Dairying**, beginning at the opening of college in January.

These courses are described on page 36.

### II. Engineering, Mechanic Arts, and Chemistry.

(a) **Four-year Course in Civil Engineering.** Page 83.

(b) **Four-year Course in Mechanical Engineering.** Page 88.

(c) **Two-year Course in Mechanic Arts.** Page 99.

(d) **Four-year Course in Electrical Engineering.** Page 104.

(e) **Four-year Course in Chemistry.** Page 111.

### III. Textile Industry.

(a) **Four-year Textile Course.** Page 121.

(b) **Four-year Dyeing Course.** Page 130.

(c) **Two-year Textile Course.** Page 140.

### IV. Normal Courses for the training of teachers in industrial subjects.

(a) **Two-year Course in Agriculture.** Page 146.

(b) **One-year Course in Agriculture.** Page 147.

(c) **May School for Teachers**, a two-weeks course designed for public school teachers who desire preparation in nature study and agriculture. Page 148. See, also, the Normal Division of the four-year Agricultural course, page 43.

### V. Graduate Courses.

Extending over one or more years and leading to advanced degrees. These are intended for students who have completed the four-year course and who desire further instruction and training in special subjects. Page 149.

**VI. Degrees.**

The four-year courses offer a combination of practice and theoretical work, about half the time being devoted to lectures and recitations and the other half to work in the shops, laboratories, drawing-rooms, greenhouses, dairies, fields, and mills. They are intended to furnish both technical and liberal education. The degree of Bachelor of Science is conferred upon a graduate of the four-year courses in Agriculture, in Chemistry, and in Dyeing; and the degree of Bachelor of Engineering is conferred upon a graduate of the four-year Engineering courses, or the four-year Textile course.

The short courses include nearly all of the practical work of the four-year courses with less theoretical instruction. They are intended for students who desire chiefly manual training. They do not lead to a degree.

## AGRICULTURAL COURSES.

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- a. The Four-year Course in Agriculture.
- b. Course in Veterinary Medicine.
- c. The Two-year Course in Agriculture.
- d. The One-year Course in Agriculture.
- e. The Six-weeks Winter Course in Agriculture.

**Aim and Scope.**—The aim of the Agricultural Courses is to train young men in both the science and the practice of their vocation. It is believed that every young man preparing to farm needs a double education—one that is practical, to fit him for his profession; another that is cultural, to fit him to live.

In order to meet the necessities of all young men who desire instruction in Agriculture, the College offers five distinct courses:

a. **The Four-year Course** aims to give a training that is thoroughly practical as well as scientific in Agriculture and its various branches, such as Stock-raising, Dairying, and Horticulture. The strictly technical portion constitutes about one-third of the work. Of the remaining two-thirds of the course, more than one-half is prescribed in the sciences. This is done for the training and information they give, and to prepare for the technical work of the course. Because of this, and because the subject-matter and the methods of the technical portion lie so fully within the domain of science, the course is essentially scientific rather than literary. Yet the College is mindful of the fundamental character of such studies as Mathematics, English Literature, Physics, etc., and they are not neglected in this course. **Full description of the Four-year Course begins on page 38.**

b. **The Course in Veterinary Medicine** has been established at this College as the result of a rapidly increasing demand for qualified veterinarians. The purpose of the course is to give a broad and thorough basic training in the fundamentals of veterinary medicine, along with abundance of practical work in the clinics, laboratories, judging and dissecting rooms.

The work of these first two years is correlated with that of the junior and senior years at a number of the better veterinary colleges, in which colleges subject credit may be obtained for work taken here. **For outline and description of course, see page 64.**

c. **The Two-year Course in Agriculture** is offered to meet the necessities of young men who wish to prepare themselves in the art rather than in the science and art of agriculture. This course does not lead to graduation, but is designed to help young men better fit



themselves by a year or two of practical work for their chosen sphere of industrial activity in the garden, orchard, on the farm, and in the production of animals and animal products. **The Two-year Course is described on page 70.**

**d. The One-year Course in Agriculture** is designed to meet the needs of young men who are ambitious to excel in the vocation of farming, and who feel the need of better preparation for their life-work. The time which can be devoted to study is often limited; hence the topics in this course have been arranged in such a manner that the student is enabled to get the greatest amount of practical information in the time at his disposal.

Education and training pay on the farm as elsewhere. The young man who prepares himself for his life's work will make more rapid strides and will gain success much quicker than the one who does not.

The College has numerous calls for young men to manage farms and estates. It is able to fill only a limited number of them. Young men who have any talent along this line can fit themselves for this work by taking this course. **The One-year Course is described on page 75.**

**e. The Six-weeks Winter Course in Agriculture** is established to meet the needs of those who can spend only the winter at the College. The important and practical subjects of Agriculture and Horticulture and Stock-raising receive principal attention. **The Six-weeks Course is described on page 78.**

**Methods of Instruction.**—Instruction is by laboratory work, supplemented by text-books, lectures, and reference readings, which are assigned from standard volumes and periodicals.

The equipment for the technical work of the Agricultural course is rapidly increasing. The Dairy Department is equipped with a modern creamery for pasteurizing, separating, creaming, and churning, and for investigation in dairy bacteriology.

The department makes free use of the fields, orchards, and gardens, in which the Agricultural Experiment Station conducts experiments in methods of culture, in effects of several practices on yield and on fertility, and in varieties of fruit, of vegetables, and of forage crops. The methods employed and the results obtained are freely used for instruction.

## DEPARTMENT OF AGRICULTURE.

## I (a). Four-year Course in Agriculture.

This course leads to the degree of Bachelor of Science.

## Freshman Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Mathematics, 110, 111.....	5	5	5
English, 120, 121.....	3	3	3
Botany, 30.....	3	3	3
Agriculture, 1.....	3	--	--
Animal Husbandry, 40.....	--	3	3
Chemistry, 90.....	3	3	3
Drawing, 142.....	2	--	--
Physiology, 60.....	--	2	2
Military Drill, 150.....	3	3	2
Totals.....	22	22	21

## Sophomore Year.

Dairying, 48.....	4	--	--
Physiology, 60.....	2	--	--
Poultry, 51.....	--	3	3
Plant Physiology, 32.....	3	--	--
Wood Shop, 140.....	--	2	2
Plant Propagation, 20.....	--	3	--
Vegetable Gardening, 21.....	--	1	4
Zoology, 80.....	2	2	--
Entomology, 81.....	--	--	2
Chemistry, 91.....	3	3	3
Physics, 100.....	2	2	2
English, 122, 123.....	3	3	3
Tactics, 151.....	1	1	1
Military Drill, 150.....	3	3	2
Totals.....	23	23	22

**AGRONOMY DIVISION.**  
**Junior Year.**

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Farm Equipment, 2.....	--	2	2
Farm Crops, 3.....	2	2	2
Soils, 10.....	3	3	3
Bacteriology, 33.....	2	2	2
Animal Husbandry, 41, 42, 43.....	3	3	3
Entomology, 61.....	2	--	--
Agricultural Chemistry, 92.....	2	2	2
English, 124.....	3	3	3
Horticulture, 22, 23.....	4	4	4
Military Drill, 150.....	3	3	2
Totals.....	24	24	23

**Senior Year.**

Special Crops, 4.....	3	3	3
Farm Management, 5.....	3	--	--
Agronomy, 6.....	--	3	3
Fertilizers, 11.....	--	2	2
Drainage, 12.....	2	--	--
Plant Diseases, 32.....	2	2	2
Live-stock Management, 44.....	3	3	3
Chemistry, 93.....	2	2	2
Economics, 125.....	1	1	1
Elective.....	6	6	6
Totals.....	22	22	22

## HORTICULTURAL DIVISION.

## Junior Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Animal Husbandry, 41, 42, 43.....	3	3	3
Soils, 10.....	3	3	3
Entomology, 81.....	2	--	--
Farm Crops, 3.....	2	2	2
Farm Equipment, 2.....	--	2	2
Agricultural Chemistry, 92.....	2	2	2
Bacteriology, 33.....	2	2	2
English, 124.....	3	3	3
Practical Pomology, 22.....	4	2	--
Plant Breeding, 23.....	--	2	4
Military Drill, 150.....	3	3	2
Totals.....	24	24	23

## Senior Year.

Farm Management, 5.....	3	--	--
Special Crops, 4.....	3	3	3
Fertilizer, 11.....	--	2	2
Systematic Pomology, 24.....	3	--	--
Floriculture, 25.....	3	--	--
Landscape Gardening, 26.....	--	3	3
Horticulture (elective), 27.....	--	3	3
Plant Diseases, 32.....	2	2	2
Entomology, 82.....	2	2	2
Chemistry, 93.....	2	2	2
Economics.....	1	1	1
Elective.....	3	4	4
Totals.....	22	23	22

ANIMAL HUSBANDRY DIVISION.

Junior Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term
Farm Equipment, 2.....	--	2	2
Farm Crops, 3.....	2	2	2
Soils, 10.....	3	3	3
Bacteriology, 33.....	2	2	2
Animal Husbandry, 41, 42, 43.....	3	3	3
Veterinary Medicine, 61, a, b, c.....	4	4	4
Entomology, 81.....	2	--	--
Agricultural Chemistry, 92.....	2	2	2
English, 124.....	3	3	3
Military Drill, 150.....	3	3	2
Totals.....	24	24	23

Senior Year.

Special Crops, 4.....	3	3	--
Farm Management, 5.....	3	--	--
Fertilizers, 11.....	--	2	2
Live-stock Management, 44.....	3	3	3
Advanced Breeding, 45, or Advanced Dairying, 49.....	3	--	--
Advanced Feeds, 45, or Dairy Bacteriology, 35.....	--	3	--
Market Classes and Grades of Meat, 47.....	--	--	3
Dairy Manufacture, 50.....	--	--	3
Poultry, 52.....	--	--	3
Veterinary Medicine, 62.....	3	3	3
Chemistry, 93.....	2	2	2
Economics, 125.....	1	1	1
Elective.....	4	5	5
Totals.....	22	22	22

## VETERINARY DIVISION.

## Junior Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Farm Crops, 3.....	2	2	2
Soils, 10.....	3	3	3
Bacteriology, 33.....	2	2	2
Animal Husbandry, 41, 42, 43.....	3	3	3
Anatomy, 64, and Clinics, 67.....	3	3	3
Histology, 63.....	3	3	3
Agricultural Chemistry, 92.....	2	2	2
English, 124.....	3	3	3
Materia Medica, 65 (elective).....	--	2	2
Military Drill, 150.....	3	3	2
Totals.....	24	26	25

## Senior Year.

Special Crops, 4.....	3	3	--
Live-stock Management, 44.....	3	3	3
Breeding, 45.....	3	3	3
Feeding, 46, or.....			
Grades and Classes of Meats, 47.....			
Poultry, 52.....	--	--	3
Anatomy, 67, and Clinics, 72.....	3	3	3
Veterinary Physiology, 68.....	2	2	2
Pathology and Bacteriology, 69.....	3	3	3
Materia Medica and Pharmacy, 70.....	3	--	--
Physical Diagnosis, 71.....	--	3	3
Elective.....	2	2	2
Totals.....	22	22	22

**NORMAL DIVISION.**

**Junior Year.**

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Animal Husbandry, 41, 42, 43.....	3	3	3
Soils, 10.....	3	3	3
Entomology, 81.....	2	--	--
Farm Crops, 3.....	2	2	2
Farm Equipment, 2.....	--	2	2
Agricultural Chemistry, 92.....	2	2	2
Bacteriology, 33.....	2	2	2
English, 124.....	3	3	3
Practical Pomology, 22.....	4	2	--
Plant Breeding, 23.....	--	2	4
Military Drill, 150.....	3	3	2
Totals.....	24	24	23

**Senior Year.**

Farm Management, 5.....	3	--	--
Special Crops, 4.....	3	3	--
Fertilizers, 11.....	--	2	2
Poultry, 52.....	--	--	3
Live-stock Management, 44.....	3	3	3
Plant Diseases, 32.....	2	2	2
Mathematics.....	5	5	5
Chemistry, 93.....	2	2	2
Elective.....	4	5	5
Totals.....	22	22	22

## Senior Electives.\*

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
English, 125, 126.....	2	2	2
Advanced Soils, 13.....	3	3	3
Bacteriology, 34.....	3	3	3
Advanced Chemistry, 94.....	3	3	3
Advanced Physiology, 69.....	2	2	2
Histology, 63.....	3	3	3
Poultry, 52.....	--	--	3
French, German, Spanish, 130, 131, 132.....	3	3	3
Economics, 125.....	1	1	1
Drill, 150.....	3	3	3

## AGRICULTURAL EQUIPMENT.

In addition to Patterson Hall and the Animal Husbandry Building, with their classrooms, laboratories, dairy, stock-judging room and offices, the College possesses the following equipment for instruction in Agriculture:

The farm includes four hundred and eighty-five acres, with two hundred and sixty acres under cultivation; a two-story sixteen-stall horse and storage barn; a fifty-stall dairy barn; a large combination horse, implement, and storage barn; a large implement, fertilizer and grain barn; and a calf barn; silos with capacity for four hundred tons of silage; a No. 18 Ohio feed and ensilage cutter operated by an electric motor, and implements and machinery necessary for up-to-date farming.

The live stock consists of the necessary Percheron mares and mules, a Percheron stallion, a herd of dairy cattle, and pure-bred swine. Breeding stock is sold as a part of the farm products.

The poultry plant has thirty breeding pens with necessary yards, the houses being of several different types best suited to poultry-keeping in North Carolina: an incubator cellar with several makes of incubators; a brooder house heated by hot water, and several makes

\*Any subject not in the student's required course may be elected in addition to the subjects in this list, with the approval of the departments concerned.



of indoor and outdoor brooders. The feed-room is equipped with steam engine, grist and bone mills. Ten or fifteen varieties of poultry are kept, and eggs and breeding fowls are sold to the public.

The horticultural equipment consists of about thirty acres in tree fruit, nuts, vineyard, berries, and vegetables, in appropriate assortment of classes and varieties for demonstration and instruction. These afford means for work in seed selection, bud studies, propagation, budding, grafting, transplanting, pruning, spraying, and variety study.

The dairy equipment is complete and thoroughly modern. The laboratory occupies about four thousand feet of floor space in Patterson Hall, and is equipped for instruction in farm dairying, retailing milk, creamery practice, cheese and butter making, milk testing and pasteurizing. The dairy equipment is modern and complete.

The North Carolina Experiment Station is a department of the College, and its close association with the School of Agriculture gives exceptional opportunities to the Agricultural students for instruction and observation covering experiments and research in agronomy, chemistry, horticulture, vegetable pathology, plant diseases, bacteriology, dairy and animal husbandry, poultry husbandry, veterinary science, and entomology.

## AGRONOMY.

### Subjects of Instruction.

**1. Agriculture.**—Introductory to Agriculture in its broader sense. The simpler properties of soils, tillage, fertilizers, conservation of fertility; crops of North Carolina, seed selection, rotation, etc., are briefly considered by lectures and practical demonstrations in the laboratory and in the fields. Three periods, first term. Required of Freshmen. Professor NEWMAN.

**2. Farm Equipment.**—Lectures and recitations upon selecting, planning, and equipping farms; locating, planning, and erecting farm buildings; tools and miscellaneous appliances; farm power; fences, gates, and bridges; farm roads. Two periods, second and third terms. Required of Juniors. Professor NEWMAN.

**3. Farm Crops.**—Recitations and lectures upon the history, production, uses, and marketing of farm crops. Exercises in the field and laboratory, covering tillage, seed selection, storage, and rotation. The crops grown upon the College farm are used for instruction and demonstration, supplementing laboratory, lecture, and text-book instruction. Two periods, first, second, and third terms. Required of Juniors. Mr. HOOPER.

4. **Special Crops.**—This course embraces advanced work in farm crops and is a continuation of the Junior work, but is more specialized and technical. Corn, cotton, small grain, hay and forage crops and the principal legumes are studied in detail, as well as such other crops as time will permit. Rotation and the conservation and development of fertility in connection with their use on the farm or the sale of the various crops. The practical application of the principles of breeding is applied to cotton, corn, and cowpeas. Each student is required to present a monograph on some crop or some subject of close relationship to important crops of the State. Three periods, first, second, and third terms. Required of Seniors. Professor NEWMAN, Mr. HODSON.

5. **Farm Management.**—Types of farming and their relation to soil, climate, labor, transportation, population, capital, and land values; operating expenses; systems of land tenure; farm organization; size of farms; location and arrangement of buildings, roadways, fences, water supply, orchard, garden, etc.; factors governing nature and amount of equipment; financial accounts; farm records; diversification; rotation from a business point of view; cropping systems; relationship of animal and plant production; maintenance of fertility; standard of living; schools, churches. Three periods, first term. Required of Seniors. Professor NEWMAN.

6. **Agronomy.**—This course is for students specializing in Agronomy. Each student will select a subject or a group of allied subjects for investigation, be given references, and required to submit the results of his studies in bulletin form. Three periods, second and third terms. Required of Seniors in Agronomy Division. Professor NEWMAN, Mr. HODSON.

## SOILS.

### Equipment.

The Soils Department has a large new laboratory in Patterson Hall furnished with solid oak desks and lockers so arranged as to accommodate a large number of students in general soils work and to allow individual locker space with plenty of working room for each student. These desks and lockers, with other tables and soil chests, were designed and made to order for this laboratory, and hence are arranged to give the greatest convenience and the most complete use of the room that is possible.

The apparatus is all of the latest and most approved models, giving greater utility and accuracy, combined with simplicity, than would be possible with any other.

In addition to the laboratory facilities, the department makes use of the College farm for its practical work in drainage, terracing, fertilization, cultivation, and study of soil types. A series of plats for soil demonstration work has been arranged which is expected to illustrate many features of practical importance in the maintenance of soil fertility.

#### Subjects of Instruction.

**10. Soils.**—Attention is given to the forces that decompose and disintegrate rock and to the influence of these forces and of the various kinds of rock on the resulting soil. The physical characters, such as water-holding capacity, capillarity, drainage, effect of mulches, temperature and weight, and the modification of these characters by tillage, cropping, and all operations of practical soil management, are discussed and exemplified in the classroom, laboratory, and field. Some attention is given to the classification of soils in the United States, and especially in North Carolina. The physical, chemical, and bacteriological soil conditions are discussed in relation to each other and to their effects on soil fertility. Systems of maintaining the permanent productiveness of soils are studied. Three periods throughout the year. Required of Juniors. Prerequisite, Chemistry 90 and 91 and Physics 100. Professor SHERWIN.

**11. Fertilizers.**—Fertilizing as a factor in soil management and economical crop production. Sources, composition, availability, and value of various commercial and farm fertilizers. Comparative value of the elements of plant food in different carriers as shown by their productive capacity. Fertilization of all the principal crops of the State and of any special crops in which the class is interested will be discussed, considering amount, method, and time of application, as well as the most economical formula to use. Two periods, second and third terms. Required of Seniors. Prerequisite, Soils 10. Professor SHERWIN.

**12. Farm Drainage.**—This includes both principles and practice of drainage. The student becomes familiar with the use of various drainage instruments and implements, as the course involves considerable field work in laying out systems of under-drains. Different methods of leveling and determining grade are discussed and practiced.

Determination of size of tile needed, depth and method of laying, influence of depth of tile and distance apart of drains on withdrawal of water from the soil, and all of these as influenced by texture and character of the soil, are considered. Drainage by means of open ditches and surface drainage by means of terraces will also be given

attention. Two periods a week, first term. Required of Seniors in Agronomy. Elective for all other Seniors. Prerequisite, Soils 10. Professor SHERWIN.

**13. Advanced Soils.**—In this course the student will be guided in the study of any line of Soils work he may choose, either along practical or scientific lines. Laboratory work will be given. Considerable reference will be made to Experiment Station literature with the aim of acquainting the student with the literature on the subject and with the methods of investigation used. Three periods a week throughout the year. Elective for Seniors. Prerequisite, Soils 10. Professor SHERWIN.

## HORTICULTURE.

### Equipment.

The Department of Horticulture is provided with facilities for instruction which are singularly efficient in many respects; and additional ones which are to be expected in the near future will equip it with unexcelled means of teaching Horticulture in all its branches. At present, the offices, classrooms, laboratory, and storage spaces of the department are located in Patterson Hall. The department also has the management of about twenty-five acres of land devoted to fruits and vegetables of all kinds, and of the college campus, covering about fifty-five acres, which is in process of development in accordance with artistic and scientific principles of landscape design.

The laboratories are used for practice work in all methods of propagation of plants; the study of buds and twigs of fruit and ornamental plants; the study of vegetables, fruits, and nuts; the design of greenhouse structures, landscape plans and specifications; and of the sorting, grading, and packing of horticultural products. A supply of necessary apparatus is on hand, and consists of knives; pruning shears and saws; grafting and budding tools; spray pumps, wheel hoes, and seed drills; fruit and vegetable packing tables; and market packages of all standard kinds. Practice work is an essential adjunct of every course. Student work under competent supervision is employed in all parts of the grounds.

Exceptional facilities for instruction in Pomology and Plant Breeding are possessed by the department in the management of the Horticultural Grounds, which contain about twenty-five acres of land planted with the best varieties of all fruits which will grow in North Carolina. In these grounds there is an orchard each of apples, pears, peaches, pecans, and figs; a vineyard each of "bunch" and muscadine grapes; and smaller plantings of plums, persimmons, quinces, cherries, raspberries, blackberries, dewberries, strawberries, and other small

fruits. The remaining and intermediate spaces are used for growing vegetables; the maintenance of a nursery for fruit and ornamental plants; and the ornamental planting about the dwelling situated near the middle of the grounds, which, as a whole, are designed to serve as a model of a small fruit farm economically and tastefully arranged.

A separate plat of land covering about five acres is used entirely for vegetable gardening purposes. Here students are assigned plats of equal size, and are required to plan, plant, cultivate, and harvest vegetable crops—to apply the knowledge acquired in the classroom. In addition to the methods common to the trucking industry and the home garden, the growing of a large quantity of vegetables for the College Dining Hall furnishes an excellent opportunity for instruction in market-gardening practices.

#### Subjects of Instruction.

**20. Plant Propagation.**—A course in the study of the principles involved, and the methods employed, in the multiplication of plants. Seedage, separation and division, layerage, cuttage, and graftage are considered in turn. The student is given an opportunity to acquire skill in propagation by practicing the most common and approved methods used with vegetable, fruit, and ornamental plants. Three periods, second term; recitation two hours, practice two hours per week. Required of Sophomores. Mr. CRIDER.

**21. Vegetable Gardening.**—A course dealing with the principles and practices of the Home, Truck, and Market Gardening areas. Special attention is given to the Home Garden and Trucking industry in North Carolina. The work consists in the selection of sites and soils; and treats of manures and fertilizers, sowing of seeds, handling of plants, transplanting and planting, construction and management of hotbeds and cold frames, and the culture, harvesting, storing, and marketing of all important vegetables. One period, second term; practice, two hours. Four periods, third term; recitation three hours, practice two hours per week. Required of Sophomores. Prerequisites: Horticulture 20. Mr. CRIDER.

**22. Practical Pomology.**—A course treating of the location of orchards; the selection of sites and soils; the choice of varieties; the preparation of the land; and the planting, cultivation, fertilizing, pruning, harvesting, and marketing of North Carolina fruits. Practice consists in the inspection and examination of sites and soils; the making of orchard plans; laying out the orchard; handling and planting trees; training and pruning; and the exercise of modern methods of picking, grading, packing, and marketing fruits. Four periods,

first term: recitation three hours, practice two hours. Two periods, second term: recitation one hour, practice two hours per week. Required of Juniors in Horticultural and Normal divisions. Prerequisite: Horticulture 20. Professor PILLSBURY.

23. **Plant Breeding.**—A course in the study of the fundamental laws of plant breeding, and the application of principles to the practice of the most approved methods of selection, hybridization, origination and improvement of varieties of plants. Two periods, second term: recitation two hours. Four periods, third term: recitation two hours, practice four hours per week. Required of Juniors in Agronomy and Horticultural divisions. Prerequisite: Horticulture 20. Professor PILLSBURY.

24. **Systematic Pomology.**—A course which deals with the origin, evolution, and classification of varieties of fruits. Practice work consists in describing, identifying, classifying, and judging varieties of apples, pears, peaches, plums, grapes, and other fruits in season. Three periods, first term: recitation two hours, practice two hours per week. Required of Seniors in Horticultural Division. Prerequisite: Horticulture 22 and 23. Professor PILLSBURY.

25. **Floriculture.**—A course which treats of the principles and practice of growing plants under glass. Practice consists in designing greenhouse structures, and the handling, culture, harvesting, and marketing of the principal greenhouse crops. Three periods, first term: recitation two hours, practice two hours per week. Required of Seniors in Horticultural Division. Prerequisite: Horticulture 20. Professor PILLSBURY.

26. **Landscape Gardening.**—A course in the study of the principles of the arts of design and their application to the design of landscapes. The principal styles of composition are considered and compared as to history, development, and adaptation. Practice consists in a study of landscape materials, and in mapping, designing plans and specifications, and in the execution of important parts of the practical work of improving grounds, such as grading, laying out drives and walks, and areas for planting, making lawns, and planting ornamental plants. Three periods, second and third terms: recitation two hours, practice two hours per week. Required of Seniors in Horticultural Division. Prerequisites: Horticulture 25. Professor PILLSBURY.

27. **Horticulture, Elective.**—A course designed to give the student an opportunity to elect and to pursue the study of some special line of horticultural investigation. Three periods, second and third terms: hours to be arranged. Open to Seniors in Horticulture only. Professor PILLSBURY.

**BOTANY.**

(Botany, Plant Pathology and Bacteriology.)

**Equipment.**

Three commodious laboratories and a large recitation and lecture room are devoted to Botany, Bacteriology, and Plant Pathology. A research-room is provided for the use of advanced students. There are also offices for the professor and instructors, and a storeroom, a dark-room, and an incubator-room. All rooms are supplied with electricity, gas, and hot and cold water, and the bacteriological laboratory is, in addition, provided with steam under 80 pounds pressure for purposes of sterilizing. The laboratories are supplied with wall-cases, shelves, herbarium cases, specimen boxes, sterilizers, incubators, microscopes, microtomes, a liberal supply of glassware, and such small utensils as are needed in the prosecution of the work. The incubator-room is fire-proof, and is provided with a Weisnegg regulator capable of keeping the temperature of the room practically invariable. The excellent herbarium has been mounted, and is now accessible for class use. There is an extensive collection of seeds, both of weeds and cultivated plants, and the most important plant diseases are represented by herbarium and alcoholic specimens.

**30. Elementary Botany.**—Recitation, laboratory work and reference reading regarding the algae, fungi, ferns, and seed plants. Morphology is emphasized, and the broad principles of nutrition, reproduction, growth, sex, adaptation, and evolution are illustrated. Particular consideration is given to the fungi and seed plants. The student's knowledge is made his own through laboratory work and simple independent investigations. Three periods, first, second, and third terms. Required of Freshmen. Prerequisites for other courses in the Department. Professor FULTON, Mr. ROSENKRANS.

**31. Plant Physiology.**—Recitation, lecture, and laboratory study of such fundamental physiological processes of plants as are of particular interest to students of agriculture. Absorption, nutrition, growth, and reproduction are considered. Three periods, first term. Required of Sophomores. Professor FULTON, Mr. ROSENKRANS.

**32. Plant Diseases (Advanced).**—A study of representative crop diseases. This course is intended to prepare the student for practical control or further study of plant diseases. Two periods. Required of Seniors in Horticulture and Agronomy. Professor FULTON.

**33. Bacteriology.**—Lectures and laboratory work on the physiology, morphology, and economy of bacteria, with especial reference to home sanitation and disinfection, and to the relation of bacteria to

disease in plants and animals and to agricultural practice. The student becomes familiar in the laboratory with methods of culture and investigation in bacteriology. Two periods. Required of Juniors. Mr. NORRON.

**34. Bacteriology (Advanced).**—A course designed to extend knowledge in special fields and to perfect the technique in bacteriology for those who desire to do original work in this subject. Work may be elected in sewage bacteriology, dairy bacteriology, bacterial plant diseases, or in bacteriology of manure, water, soil, or air. The course is flexible, and will be made to fit the requirements of those students electing it. Three periods. Elective for Seniors. Prerequisite: Botany 33. Professor FULTON, Mr. NORRON.

**35. Dairy Bacteriology.**—Lecture and text-book course covering the more important facts in the relation of bacteria to dairying. The laboratory course consists in demonstrating and supplementing the lecture course. Practice is given in pasteurizing milk and cream for market, and in making and using starters in butter and cheese-making. Two periods, first term. Elective for Seniors. Prerequisite: Botany 33. Mr. NORRON.

#### ANIMAL HUSBANDRY.

##### Equipment.

The Animal Husbandry Department now occupies the Animal Husbandry Building, which was completed during the summer of 1912. This building was constructed at a cost of twenty-five thousand dollars, and is up-to-date in every way. The department has offices, classrooms, record-room, and stock-judging room, furnishing excellent facilities for students in Animal Husbandry.

The live-stock equipment has been added to materially during the past year. A fine registered Percheron stallion and three high-grade mares have been purchased for horse work. These are all used for farm work and breeding purposes as well as for class work. The dairy herd now consists of seventy-five head, of which about forty are cows in milk. Three leading breeds are represented, consisting of twelve high-grade Holstein cows and a registered bull, six pure-bred Ayrshire cows and a bull, twelve pure-bred Jerseys and a bull, the remainder being grade Jerseys and Guernseys. This gives splendid material for class work in the study of dairy breeds.

Two Shorthorn, two Aberdeen Angus, and two Hereford steers are kept as material to be used in teaching methods of judging beef animals and for study of the leading beef breeds.

A herd of pure-bred swine has been established, consisting of the following breeds: Berkshire, Duroc Jersey, and Chester White.



Good individuals have been selected and enough animals will be maintained to give the student a splendid opportunity for swine work.

The product of the dairy is sold as milk, butter, and cream to the College Dining Hall and to city customers.

**40. Breeds of Live Stock.**—A study of the origin, history, characteristics, adaptability, and popularity of the breeds of live stock. Every opportunity will be taken advantage of to teach the student the merits of the various breeds, and, when possible, classes of the breeds will be judged. Three periods per week, second and third terms. Required of Freshmen. Professor McNUTT.

**41. Animal Breeding.**—A study of the fundamental laws and principles underlying the science of breeding, and the application of these laws in breeding the different species of domestic animals. Three periods per week, third term. Required of Juniors. Professor McNUTT.

**42. Stock Feeding.**—A study of the composition of feeds and the food requirements of the domestic animals. The student will be required to become familiar with the fundamental principles so that he can compound suitable rations for the different classes of live stock. Especial emphasis will be laid upon practical problems in feeding. Three periods per week, second term. Required of Juniors. Text-book, Henry's *Feeds and Feeding*. Professor McNUTT.

**43. Live-stock Judging.**—A study of the score-card and its use. A comparison of the score-cards for the various breeds, and practical scoring. Methods and rules in judging the various classes of live stock. In practical judging the student will be required to give oral or written reasons to sustain his placing of the animals. Three periods per week, first term. Required of Juniors. Professor McNUTT.

**44. Live-stock Management.**—A study of the rules and regulations governing the importation of live stock into the United States, and the shipment of same in the United States. The feeding, care, and management of breeding and work stock, as well as fattening stock. Lecture course. Three periods per week throughout the year. Required of Seniors. Professor McNUTT.

**45. Advanced Animal Breeding.**—A study of the Flock, Herd, and Stud books, and the rules governing registration as laid down by the different breed associations. Pedigree work will be included to give the student a clear idea of the leading families and prominent individuals. Three periods per week, first term. Required of Seniors. Professor McNUTT.

**46. Advanced Stock Feeding.**—Continuation of Course 42, with special emphasis laid upon practical feeding. The experimental work on feeding that has been done by the various experiment stations will be reviewed to give the student a clear conception of the importance and value of such work. Three periods each week, second term. Required of Seniors. Professor McNUTT.

**47. Market Classes and Grades of Meat.**—A study of the market classes and grades of beef cattle, sheep, and swine; also slaughtering, marketing, and meat cutting. The relative value of the cuts from the various parts of the carcass will be given due consideration. Three periods each week, third term. Required of Seniors. Professor McNUTT.

#### DAIRYING.

**Dairy Equipment.**—The dairy laboratory occupies about four thousand square feet of floor space in the basement of the Patterson Hall, besides the locker-rooms, the toilet, and bath rooms on the same floor.

The main dairy laboratory is thirty-six by fifty-seven feet, and is fitted throughout with modern equipment suited to giving up-to-date instruction in farm dairying, retailing milk, and creamery practice. The equipment for the farm dairying consists, in the main, of De Laval, Sharples, Empire, National, United States, and Simplex hand separators, swing and barrel hand churns of different sizes; cream vats, hand and power butter-workers, aerators and coolers, milk-testers, and other articles useful in doing farm dairy work.

Milk-testing, which plays such an important part in all phases of dairy work, receives a great deal of attention. Several sizes of hand machines and a twenty-four bottle power tester are used in this work, together with all equipment necessary for testing milk, cream, butter, cheese, skim-milk, and whey. The lactometer is also used to determine milk solids and specific gravity.

The equipment for giving instruction in commercial dairying consists of milk pump, receiving vat, tempering vat, turbine separator, continuous pasteurizer, combined churn and butter-worker, bottling outfit, and bottle-washing and sterilizing outfit.

#### Subjects of Instruction.

**48. Dairying.**—Text-book and lecture course covering the fundamental principles of modern dairying. The laboratory work consists of practice in the use of modern dairy equipment. Each student is required to become familiar with the construction, care, and operation of the leading makes of cream separators. Proficiency is required of the student in testing and standardizing milk and cream,

and in cream-ripening, churning, working, packing, and scoring butter. Four periods each week, first term. Required of Sophomores. Mr. SANBORN.

49. **Advanced Dairying.**—A study of the practical problems in dairy management. Dairy barn construction and arrangement of building and lots. The different phases of dairying will be studied from an economic standpoint. Three periods, first term. Professor McNUTT.

50. **Advanced Dairying.**—A study of the production of sanitary and certified milk. Dairy inspection with practice in scoring dairies. Milk inspection for adulterants and preservatives and butter scoring. Three periods a week, third term. Professor McNUTT.

#### POULTRY HUSBANDRY.

The poultry plant has thirty breeding pens with necessary yards, the houses being of several different types best suited to poultry keeping in North Carolina; an incubator cellar with several different makes of incubators; and a brooder house, which is heated by hot water. Both indoor and outdoor brooders of several different makes are used.

The following varieties of poultry are kept: Barred, Buff, and White Plymouth Rock; White and Columbian Wyandotte; S. C. Rhode Island Red; S. C. White and Brown Leghorn; S. C. Black Minorca; and Buff and White Orpington.

51. **Poultry Husbandry.**—Classification and study of the breeds of domestic poultry; breeding, feeding, and management; construction and location of poultry houses; production and marketing of eggs; production, killing, and marketing of poultry; incubation and brooding. Three periods, second and third terms. For Sophomores. Mr. TAYLOR, Mr. ROSS.

52. **Poultry Husbandry.**—Theory and practice of judging fowls by comparison; comparison of different systems of poultry keeping; artificial incubation and brooding. Capons and caponizing. Three periods, third term. For Seniors. Mr. TAYLOR, Mr. ROSS.

#### VETERINARY SCIENCE.

(Anatomy, Physiology, and Veterinary Medicine.)

**For Course in Veterinary Medicine, see page 64.**

#### Equipment.

For instruction in the above subjects, the department is provided with offices, lecture-rooms, laboratories, pharmacy-room (for drugs and surgical instruments), and dissecting-room.

The offices contain the usual office fixtures, besides a library of most of the standard works on veterinary medicine in English.

For use in classroom and laboratory, the department is supplied with mounted skeletons of man, of horse, and of cow; also numerous specimens of tumors, tuberculous organs, bony lesions of spavins, splints, ring bones, and side bones. Besides the collection illustrating disease tissues, the department has a large collection of parasites which infest domestic animals.

The laboratories are provided with wall cases, work tables and desks, washing sinks, hot and cold water, gas burners, and electric lights. The laboratory for special work has microtome (for cutting sections of tissues for study with microscope), glass slides, stains, and the various materials required for making temporary and permanent mounts of healthy and diseased tissues. The larger laboratory is supplied with the necessary equipment for conducting exercises in physiology.

In the pharmacy-room are samples of a large number of drugs used in comparative medicine, and a more or less complete set of surgical instruments, including an operating table for small animals, and casting harness and slings for larger animals.

#### Subjects of Instruction.

**60. Animal Physiology.**—This subject during the Freshman year will include a study of the structures of the body and of the composition of foods. In the Sophomore year it will include a comparative study of the bodily functions of man and of the domestic animals. The subject will be covered by lectures and recitations, demonstrations, and laboratory exercises. Two periods, second and third terms. Required of Freshmen. Two periods, first term. Required of Sophomores. Professor ROBERTS, Doctor SIMMS.

**61. Veterinary Medicine**—(a) **Veterinary Anatomy.**—Text-book, supplemented by lectures and illustrated by charts, models, skeletons, sketches, and dissections. Anatomy being a fundamental subject in any system of medicine, and essential to a thorough knowledge of live stock, the first term will be largely devoted to this study, special attention being given to the organs of digestion and locomotion, and such other parts as are of interest to the stock farmer. One period each week will be devoted to a clinic. Four periods, first term. Required of Juniors in Animal Husbandry Division. Professor ROBERTS, Doctor KOONCE.

(b) **Veterinary Medicine.**—Lectures on the actions, uses, and doses of the most common veterinary medicines, and the nature and cause of disease, with special reference to its prevention. One period each

week will be devoted to a clinic. Four periods, second term. Required of Juniors in Animal Husbandry Division. Doctor SIMMS, Doctor KOONCE.

(c) **Veterinary Practice.**—Lectures on the most common diseases and injuries of domestic animals will be given. These lectures will be supplemented weekly by clinics, where drugs will be administered to sick animals and surgical operations performed. Four periods, third term. Required of Juniors in Animal Husbandry Division. Doctor SIMMS, Doctor KOONCE.

**62. Veterinary Medicine.**—Advanced course in veterinary medicine and surgery. A continuation of the subject as outlined for Juniors, special attention being given to infectious diseases communicable to man, and their significance in meat and milk inspection, and also to diseases attendant upon breeding animals. Three periods. Required of Seniors in Animal Husbandry Division. Professor ROBERTS, Doctor KOONCE.

*For agricultural students intending to pursue a veterinary course, opportunity will be given during their Junior and Senior years to elect subjects required in the Freshman and Sophomore years of such a course.*

**63. Histology.**—A microscopical study of the tissues of the body, treating of the cell as the unit of structure, and of its functions; also of tissues, their classification, and their relation to the structure of organs. From dissections, clinics, and proximity to slaughter-houses, abundance of histological material of various animals is received. Three periods. Required of Juniors in the Veterinary Division. Professor ROBERTS, Doctor SIMMS.

**64. Veterinary Anatomy.**—This subject will deal with the study of the skeleton, including bones and joints, and of muscles and digestive organs. A complete dissection of the muscles of the horse will be made. Three periods. Required of Juniors in Veterinary Division. Doctor SIMMS.

**65. Materia Medica.**—A study of the drugs used in comparative medicine will consist of their classification, composition, physiological actions, and doses. Two periods, second and third terms. Required of Juniors in the Veterinary Division. Professor ROBERTS.

**66. Clinics.**—An essential part of the training of students in comparative medicine consists in seeing for himself animals suffering with the various diseases discussed in classroom. To this end abundant clinic material is available in the veterinary hospitals in Raleigh. Three periods. Required of Juniors in the Veterinary Division. Doctors KOONCE, ROBERTS, and SIMMS.

**67. Veterinary Anatomy.**—A continuation of course 64. A study of the respiratory, circulatory, and nervous systems will be made, with complete dissection of each in the horse. Three periods. Required of Seniors in the Veterinary Division. Professor ROBERTS.

**68. Veterinary Physiology.**—A comparative study of the bodily functions of the various domestic animals is made, with special reference to digestion, respiration, circulation, and secretion. Two periods first term, and three second and third terms. Required of Seniors in the Veterinary Division. Elective in all other Senior courses. Doctor SIMMS.

**69. Pathology and Bacteriology.**—A large number of specimens of diseased tissue already present in the museum and opportunity for collecting others from clinics and abattoirs insure plenty of material to demonstrate the various macroscopical and microscopical changes in organs and tissues due to disease. Especial attention is paid to the isolation and study of the pathogenic bacteria from the various organs of diseased animals. Three periods first term, two second and third terms. Required of Seniors in the Veterinary Division. Doctor SIMMS.

**70. Materia Medica and Pharmacy.**—Course 65, as described above, will be continued, including prescription writing and laboratory work in the preparation, compounding, and dispensing of medicines. Three periods, first term. Required of Seniors in Veterinary Division. Doctor SIMMS.

**71. Clinical Diagnosis.**—This subject is taught for the purpose of studying the methods for the examination of animals to detect and diagnose the various diseases affecting them. Three periods, second and third terms. Required of Seniors in Veterinary Division. Professor ROBERTS.

**72. Clinics.**—These will be given, as in the year previous, and will give the student opportunity of putting into practice the information he has gained from study of clinical diagnosis. In connection with the clinics autopsies are frequently held, giving the students excellent opportunities to observe changes in the body structures resulting from disease. Three periods. Required of Seniors in Veterinary Division. Doctors KOONCE, ROBERTS, and SIMMS.

#### ZOOLOGY.

**80. Zoology.**—An elementary study of all forms of animal life—regarding their general structure and classification, with particular reference to type examples of the principal groups of some economic importance—is given by text-book, laboratory work, and supplementary lectures. The first term's work is devoted to invertebrates,

but with only a brief study of the true insects. The second term covers vertebrate animals. This course is planned to give the student a general knowledge of the animal kingdom and to lay a foundation for the more special subjects that are to follow. Two periods, first and second terms. Required of Sophomores. Associate Professor METCALF.

#### ENTOMOLOGY.

**81. Economic Entomology.**—Elements of insect structure and classification. Injurious insects and remedies: (a) of orchards; (b) of small fruits; (c) of truck and garden crops; (d) of cotton, corn, tobacco, grains, and grasses; (e) of forest, shade, and ornamental plants; (f) of barn, mill, and household. Lectures and demonstrations. Two periods, third term, required of Sophomores; and two periods, first term, required of Juniors. Associate Professor METCALF.

**82. Systematic Entomology.**—Systematic study of orders and families of insects, with special reference to structure, classification, life-history, and habits. Lecture and laboratory practice. Two periods, three terms. For Seniors. Required in Horticultural Division; elective in other divisions. Associate Professor METCALF.

#### CHEMISTRY.

**90. Inorganic Chemistry.**—Newell's *Inorganic Chemistry*. The common elements and their principal compounds are studied, together with some of the fundamental principles of the science. The lectures are illustrated by experiments and the exhibition of specimens. Laboratory work accompanies the classroom work. Three periods. Required of Freshmen. Professor WITHERS, Mr. PATE, Doctor NOWELL, Mr. SHERWOOD.

**91. Analytical Chemistry.**—W. A. Noyes' *Qualitative Analysis*. After the student has learned to separate and identify elements in unknowns, special attention is given to tests of special interest to agricultural students. Three periods. Required of Sophomores. Mr. PATE.

**92. Organic Chemistry.**—Lectures and laboratory work. Remsen's *Organic Chemistry*. Two periods. Required of Juniors. Doctor NOWELL.

**93. Chemistry (Elective).**—During the Senior year the student may elect some work in the Chemistry Department from the following subjects: Organic Chemistry, Physiological Chemistry, Qualitative Analysis, Quantitative Analysis. These subjects are described more in detail under the the courses in Chemistry beginning with No. 300.

## PHYSICS.

100. **Elementary Physics.**—In this course special stress is laid upon the subjects of mechanics, liquids, gases, and heat. It includes the study of fundamental units, British and metric standard measures, definitions of force, work and power, laws of motions, principles of machines, mechanics of fluids and gases, heat, and a brief introduction to the study of sound and light. For description of the Physical equipment, see page 105. Two periods. Required of Sophomores. Mr. SOUTH.

## MATHEMATICS.

110. **Algebra.**—Wells' *New Higher Algebra*. Begins with quadratic equations and complete summation of series, embracing ratio and proportion, variation, the progressions, the binomial theorem, undetermined coefficients, logarithms, compound interest and annuities, permutations, combinations and continued fractions. At the beginning of the term a review is usually given on involution, evolution, theory of exponents, and radicals. Five periods, first term; three periods, second term. Required of Freshmen. Prerequisites for first term, entrance requirements; for second term, the work of the first term, or, in case of failure, a term standing of 60 per cent or more, and a final examination grade of at least 40 per cent, on the work of the first term. Professor YATES, Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

111. **Plane Geometry.**—Wentworth and Smith's *Plane and Solid Geometry*. A complete course in plane geometry, including numerous original exercises. Two periods, second term; five periods, third term. Required of Freshmen. Prerequisite, entrance requirements. Professor YATES, Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

## ENGLISH.

120. **Composition and Rhetoric.**—After a review of the principles of English grammar, special attention is given to the selection of subjects, the planning of essays, and to the study of words, sentences, and paragraphs. Frequent themes are required, the work being directed mainly upon the mechanics of writing and the making of reports on scientific studies. Required of Freshmen. Three periods, first term. Doctor SUMMEY, Mr. PRATT.

121. **American Literature.**—The study of the history of American literature is accompanied with the reading and analysis in class of the writings of representative American authors. Essays are based largely upon class and parallel reading. Three periods, second and third terms. Required of Freshmen. Doctor SUMMEY, Mr. PRATT.



**122. Advanced Rhetoric.**—The principles of style and the forms of discourse constitute the basis of the work. Scientific exposition in particular is studied in selected essays and addresses; and in frequent essays the principles learned are put into practice. Three periods, first and second terms. Required of Sophomores. Professor HARRISON, Doctor SUMMEY, Mr. PRATT.

**123. Public Speaking.**—The principles governing the preparation and the delivery of public addresses are given in text-book and in lectures. The reading in class of addresses in various styles, the writing of several papers by each member of the class, and practice in delivery, complete the work. Three periods, third term. Required of Sophomores. Professor HARRISON, Doctor SUMMEY, Mr. PRATT.

**124. English Literature.**—The inductive study of the development of English poetry and prose is pursued in the works of standard writers of the different periods. The continuity is emphasized by a text-book on the history of the literature. Occasional essays and parallel reading form an important part of the work. The purpose of the course is to cultivate in the student a taste for the best writings of the greatest writers. Three periods, three terms. Required of Juniors. Professor HARRISON.

**125. Journals.**—To give practical knowledge of technical and of other standard journals is the purpose of this course. The frequent essays required are mainly of scientific and technical character. Two periods, first term. Open to Seniors. Professor HARRISON.

**126. Classics.**—The lives and works of the great scientists, and of other great writers, particularly of the nineteenth century, are studied in this course. Essays will be continued as in the first term. Two periods, second and third terms. Open to Seniors. Professor HARRISON.

**127. Economics.**—An introductory study of the general principles of economics is followed by a special consideration of business organization, labor problems, money and banking, and the relation of government to industry. Special attention is devoted to rural economics. One period, three terms. Open to Seniors. Professor HARRISON, Doctor SUMMEY.

#### MODERN LANGUAGES.

The aim of the department is to enable one to use a limited vocabulary for practical purposes in speaking and writing fluently simple sentences, without idiomatic expressions or difficult constructions; to read scientific works, and to know the meaning of difficult constructions and idiomatic expressions of the foreign language.

A unilingual method is used, based on conversation, humoristic anecdotes, interesting short stories, and scientific articles. The student is taught to think in the foreign language by a direct association of thoughts with foreign expressions, without the medium of English.

The meaning and fluent use of foreign expressions are taught by a direct appeal to real objects, gestures, pictorial illustrations, cognates, context, comparisons, contrasts, and associations, beginning with leading simple questions, and gradually progressing to more advanced ones, by frequent repetitions, and by a strict adherence to the rule that answers be always given in complete short sentences of the foreign language, and never by "yes," "no," or some other short word alone.

Grammatical and lexical details for the thorough understanding of the lesson are given. The rules are deduced from the examples, and the student is trained in their correct use by interesting connected matter.

Written examinations consist of translations from English into the foreign language, and of questions and answers in the foreign language. No English appears in an examination paper. No time is allowed for hesitancy. Answers are spoken fluently and written rapidly.

Students may take any one or all of the modern languages during the Junior or Senior year. The work is optional, but credit towards a degree is allowed for the successful completion of the work.

**130. German.**—Worman's *Modern Languages*, first and second German books; *Studien und Plaudereien*, first and second books; Fischer's *Practical Lessons in German*; *Practical German Grammar*, by Calvin Thomas; *German Reader*, by Fischer; and a scientific reader. Three periods. Elective for Juniors and Seniors. Doctor RUDY.

**131. French.**—Worman's *Modern Languages*, first and second French books; Worman's *Grammaire Française*; selected short stories from French literature, and scientific readers. This subject may be taken by special petition to the Faculty. Doctor RUDY.

**132. Spanish.**—Worman's *Modern Languages*, first and second Spanish books; *Introducción a la Lengua Castellana*, by Marion y Des Garrenes; a Spanish Grammar to be selected; Fontaine's *Flores de España*, and other short stories from Spanish literature; *Modelos para Cartas*. Elective for Juniors and Seniors in Civil and Electrical Engineering. Doctor RUDY.

**SHOP AND DRAWING.**

**140. Wood Shop.**—The use and care of ordinary woodworking and bench tools. Exercises in sawing, planing, and making joints. As much time as possible is spent in making models of small buildings, gates, etc. Required of Sophomores, second term, two periods per week. Mr. WHEELER.\*

**142. Drawing.**—Elementary drawing, elementary projection, free-hand sketching and lettering. Geometrical problems. Freehand drawing. Two periods, first term. Required of Freshmen. Mr. COBURN.

**MILITARY SCIENCE.**

**150. Drill.**—Callisthenic exercises; bayonet exercises; military signaling; school of the soldier, squad, company, and battalion; ceremonies including inspection, parade, review, and guard mounting; guard duty; marches and minor tactics; attack and defense; gallery and range target practice. Three hours each week for the first and second terms; two hours each week for the third term. Captain PEACE and Cadet Officers of the Battalion.

**151. Tactics.**—Theoretical instruction in Infantry Drill Regulations, Field-service Regulations, Manual for Guard Duty, and Small Arms Firing Manual. One hour each week. Required of Sophomores. Captain PEACE.

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\*For description of the equipment, see page 92.

## I (b). COURSE IN VETERINARY MEDICINE.

As a consequence of the frequent inquiries concerning a course in Veterinary Medicine at this College and in a realization of the need of competent veterinarians for the live-stock and meat and milk inspection interests of the South, the first two years work in such a course is here outlined.

This arrangement is somewhat similar to the courses in human medicine given at other institutions in the State not offering a complete course.

This course is correlated with courses in other Veterinary Colleges, so that credit may be obtained in them for the subjects taken here.

There are a number of advantages to be gained by giving such a course in Veterinary Medicine at an Agricultural College where several of the fundamental subjects, especially along live-stock lines, are so aptly given.

Opportunity is given to Agricultural students in their Junior and Senior years to elect sufficient veterinary subjects to obtain credit for Freshman and Sophomore years in a Veterinary Course. See page 57.

For entrance requirements and fees, see pages 25 and 28.

### FIRST AND SECOND YEARS IN VETERINARY MEDICINE.

#### First Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Anatomy, 160, and Clinics, 161.....	3	3	3
Histology, 162.....	3	3	3
Materia Medica, 163.....	--	2	2
Physiology, 164.....	2	--	--
Botany, 165.....	3	3	3
Chemistry, 169.....	3	3	3
English, 168.....	3	3	3
Agriculture, 167.....	3	--	--
Breeds, 166.....	--	3	3
Drill, 190.....	3	3	2
Totals.....	23	23	22

Second Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Anatomy, 170, and Clinics, 171.....	3	3	3
Pathology and Bacteriology, 172.....	3	3	3
Materia Medica and Pharmacy, 173.....	3	--	--
Physiology, 174.....	2	2	2
Clinical Diagnosis, 175.....	--	3	3
Chemistry, 176.....	3	3	3
Physics, 177.....	2	2	2
Zoology, 178.....	2	2	--
Dairying, 181.....	--	--	4
Feeding, 179, and Judging, 180.....	3	3	--
Drill, 190.....	3	3	2
Totals.....	24	24	24

Subjects of Instruction.

160. **Veterinary Anatomy.**—This subject will deal with the study of the skeleton, including bones and joints, and of muscles and digestive organs. A complete dissection of the muscles of the horse will be made. Three periods. Required of First-year men in Veterinary Medicine. Doctor SIMMS.

161. **Clinics.**—An essential part of the training of students in comparative medicine consists in seeing for himself animals suffering with the various diseases discussed in the classroom. To this end abundant clinic material is available in the veterinary hospitals in Raleigh. Three periods. Required of First-year men in Veterinary Medicine. Doctors ROBERTS, KOONCK, and SIMMS.

162. **Histology.**—A microscopical study of the tissues of the body, treating of the cell as the unit of structure, and of its functions; also of tissues, their classification and their relation to the structure of the organs. From dissection, clinics, and proximity to slaughter-houses, abundance of histological material of various animals is received. Three periods. Required of First-year men in Veterinary Medicine. Professor ROBERTS, Doctor SIMMS.

163. **Materia Medica.**—A study of the drugs used in comparative medicine will consist of their classification, composition, physiological

actions, and doses. Two periods, second and third terms. Required of First-year men in Veterinary Medicine. Professor ROBERTS.

164. **Physiology.**—This study will include a comparative study of the bodily functions of man and the domestic animals. The subject will be covered by lectures and recitations, demonstrations and laboratory exercises. Two periods. First term. Required of First-year men in Veterinary Medicine. Doctors ROBERTS, SIMMS.

165. **Elementary Botany.**—Recitation, laboratory work and reference reading regarding the algae, fungi, ferns, and seed plants. Morphology is emphasized, and the broad principles of nutrition, reproduction, growth, sex, adaptation, and evolution are illustrated. Particular consideration is given to the fungi and seed plants. The student's knowledge is made his own through laboratory work and simple independent investigations. Three periods. Required of First-year men in Veterinary Medicine. Professor FULTON, Mr. ROSENKRANS.

166. **Breeds of Live Stock.**—A study of the origin, history, characteristics, adaptability, and popularity of the breeds of live stock. Every opportunity will be taken advantage of to teach the student the merits of the various breeds, and, when possible, classes of the breeds will be judged. Three periods per week, second and third terms. Required of First-year men in Veterinary Medicine. Professor McNUTT, Mr. SANBORN.

167. **Agriculture.**—Elementary and popular lectures introductory to the subject of Agriculture in its broad sense. The simpler properties of soils; tillage, fertilizers, conservation of fertility; seed selection; crops of North Carolina, rotation, etc., will be briefly considered by lecture and practical demonstration in the laboratory and in the field. Three periods, first term. Required of First-year men in Veterinary Medicine. Professor NEWMAN.

168. **Composition and Rhetoric.**—After a review of grammatical principles, especial attention is given to the selection of subjects and the plannings of essays, to the choice of words, and to the structure of sentences and paragraphs. Standard poetry and prose are read in class, and additional books are assigned for parallel reading. Frequent short themes are written. Three periods. Required of First-year men in Veterinary Medicine. Doctor SUMMEY, Mr. PRATT.

169. **Inorganic Chemistry.**—Browlee's *First Principles of Chemistry*. The common elements and their principal compounds are studied, together with some of the fundamental principles of the science. The lectures are illustrated by experiments and the exhibition of specimens. Laboratory work accompanies the classroom

work. Three periods. Required of First-year men in Veterinary Medicine. Professor WITHERS, DOCTOR WILLIAMS, MR. PATE.

**170. Veterinary Anatomy.**—A continuation of course 160. A study of the respiratory, circulatory, and nervous systems will be made, with complete dissection of each in the horse. Three periods. Required of Second-year men in Veterinary Medicine. DOCTOR ROBERTS.

**171. Clinics.**—These will be given as in the year previous and will give the student opportunity of putting into practice the information he has gained from the study of clinical diagnosis. In connection with the clinics, autopsies are frequently held, giving the students excellent opportunities to observe changes in body structure resulting from disease. Three periods. Required of Second-year men in Veterinary Medicine. DOCTORS ROBERTS, KOONCE, SIMMS.

**172. Pathology and Bacteriology.**—A large number of specimens of diseased tissue already present in the museum and opportunity for collecting others from clinics and abattoirs insure plenty of material to demonstrate the various macroscopical and microscopical changes in organs and tissues due to disease. Especial attention is paid to the isolation and study of pathogenic bacteria from the various organs of diseased animals. Three periods first term, and two periods second and third terms. Required of Second-year men in Veterinary Medicine. DOCTOR SIMMS.

**173. Materia Medica and Pharmacy.**—Course 163 will be continued with prescription writing and laboratory work in the preparation, compounding and dispensing of medicines. Three periods, first term. Required of Second-year men in Veterinary Medicine. DOCTOR SIMMS.

**174. Veterinary Physiology.**—A comparative study of the bodily functions of the various domestic animals is made, with special reference to digestion, respiration, circulation, and secretion. Two periods, first term, and three periods, second and third terms. Required of Second-year men in Veterinary Medicine. PROFESSOR ROBERTS, DOCTOR SIMMS.

**175. Clinical Diagnosis.**—This subject is taught for the purpose of studying the methods for the examination of animals to detect and diagnose the various diseases affecting them. Three periods, second and third terms. Required of Second-year men in Veterinary Medicine. PROFESSOR ROBERTS.

**176. Organic Chemistry.**—Lectures and laboratory work. Moore's *Outlines of Organic Chemistry*. Three periods. Required of Second-year men in Veterinary Medicine. PROFESSOR WITHERS.

**177. Elementary Physics.**—Properties of matter; fundamental units; British and metric standard measures; definitions of force, work, and power; laws of motion; principles of machines; mechanics

of fluids; heat; sound; introduction to study of light. Text-book, Hawkins' *Physics for Secondary Schools*. Two periods. Required of Second-year men in Veterinary Medicine. Mr. SOUTH.

178. **Zoology.**—An elementary study of all forms of animal life—regarding their general structure and classification, with particular reference to type examples of the principal groups of some economic importance—is given by text-book, laboratory work, and supplementary lectures. The first term's work is devoted to invertebrates, but with only a brief study of the true insects. The second term covers vertebrate animals. This course is planned to give the student a general knowledge of the animal kingdom and to lay a foundation for the more special subjects that are to follow. Two periods, first and second terms. Required of Second-year men in Veterinary Medicine. Associate Professor METCALF.

179. **Stock Feeding.**—A study of the composition of feeds and the food requirements of the domestic animals. The student will be required to become familiar with the fundamental principles so that he can compound suitable rations for the different classes of live stock. Especial emphasis will be laid upon practical problems in feeding. Three periods per week, first term. Required of Second-year men in Veterinary Medicine. Text-book, Henry's *Feeds and Feeding*. Professor McNUTT.

180. **Live-stock Judging.**—A study of the score-card and its use. A comparison of the score-card for the various breeds, and practical scoring. Methods and rules in judging the various classes of live stock. In practical judging the student will be required to give oral or written reasons to sustain his placing of the animals. Three periods per week, second term. Required of Second-year men in Veterinary Medicine. Professor McNUTT.

181. **Dairying.**—Text-book and lecture course covering the fundamental principles of modern dairying. The laboratory work consists of practice in the use of modern dairy equipment. Each student is required to become familiar with the construction, care, and operation of the leading makes of cream separators. Proficiency is required of the student in testing and standardizing milk and cream, and in cream-ripening, churning, working, packing, and scoring butter. Four periods each week, third term. Required of Second-year men in Veterinary Medicine. Mr. SANBORN.

190. **Drill.**—Callisthenic exercises; bayonet exercises; military signaling; school of the soldier; squad, company and battalion ceremonies, including inspection, parade, review, and guard mounting; guard duty; marches and minor tactics; gallery and range target practice. Three hours each week for the first and second terms. Two hours each week required of all classes. Captain PEACE and Cadet Officers of the Battalion.



## SHORT COURSES IN AGRICULTURE.

In order to meet the necessities of young men who wish to prepare themselves for the industrial arts rather than for industrial science and art, the following short courses are offered. None of these courses, of course, lead to graduation, and they are not, in any sense, intended as preparatory courses to the regular four-year classes. They are designed simply to help young men better fit themselves, by a year or two of practical work under competent and interested supervision, for their chosen spheres of industrial activity.

Those students whose inclinations, limitations, or necessities lead them to take these shorter courses will be carefully drilled in the handicraft and mechanism of their art and in the application of elementary science to the farm, dairy, garden, and orchard.

### I (c). TWO-YEAR COURSE IN AGRICULTURE.

This course offers, in addition to the purely agricultural branches, introductory and cultural subjects, and thus enables the student to secure not only all the technical and practical work of the One-year Course, but Physiography, Physics, English, and Mathematics, in addition, and all the better prepares young men to become farmers, farm managers, and teachers of agriculture and allied branches in the public schools. A description of the equipment will be found on page 44.

#### First Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Agriculture.....	2	2	2
Soils.....	--	2	2
Physiography.....	2	--	--
Principles of Plant Culture.....	--	--	2
Physics.....	2	2	2
Forge.....	2	2	..
Woodwork.....	2	2	2
Mathematics.....	5	5	5
English.....	3	3	3
Drill.....	3	3	3
Totals.....	21	21	21

## Second Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Agriculture.....	3	2	3
Soils and Fertilizers.....	3	3	..
Animal Husbandry.....	3	3	3
Dairying.....	..	..	4
Veterinary Science.....	..	3	..
Poultry Husbandry.....	..	3	3
Fruit Culture.....	3	1	..
Vegetable Gardening.....	..	..	3
Plant Life.....	2	..	..
Diseases of Plants.....	..	3	..
Entomology.....	..	2	2
English.....	3	3	3
Drill.....	3	3	2
Totals.....	23	23	23

## Subjects of Instruction.

**Agriculture (Two-year Course).—First Year:** A broad elementary introduction to the study of Agriculture, including the more important field crops of the State. The history, classification, adaptation, culture, harvesting, marketing, and uses of corn and small grain. Two hours for three terms. Mr. HODSON.

**Second Year:** Cotton, legumes, hay and forage plants, seeds and seed selection; farm equipment, farm management. Three periods first term, two periods second term, and three periods third term. Professor NEWMAN, Mr. HODSON.

**Physiography.**—A study of the natural agencies affecting the earth's surface: soil, water, air, and temperature, and their effect upon plants and animals. Two periods first term. Required of first-year students. Mr. HODSON.

**Soils.**—**First Year:** An elementary study of soils; different types and classes in relation to earliness, warmth, water-holding capacity, drainage, weight, and fertilization. An elementary study of plant food in the soil, including humus and its effect on crop production.

The proper use of plows and cultivators and their influence on the production of better crops. Two periods a week, second and third terms. Professor SHERWIN.

**Soils.**—*Second Year:* This will include a study of the soils of the State; their formation and classification into agricultural types; their physical properties; relation to moisture and air supply; best methods of conserving and regulating the soil moisture; principles and practice of drainage. The effect of different soil and crop treatments, such as rotation, cultivation, and fertilization, will be studied. Considerable attention will be given to humus, farm manures, and green manures, and to the use and home-mixing of fertilizers, with special reference to the time and methods of using and the best mixtures for the various crops on different types of soil. Three periods, first and second terms. Professor SHERWIN.

**Principles of Plant Culture.**—*First Year:* A course in which the functions of the various parts of plants; the activities engendered by heat, cold, moisture, and light, in seedage and other methods of propagation; the effect of soil and climate, and the principles of plant propagation, training, and pruning, are considered. Practice work consists of laboratory exercises demonstrating the facts studied. Two periods, third term. Mr. CRIDER.

**Fruit Culture.**—*Second Year:* This course treats of fruit growing as applied to the different sections of the State and the possibilities embodied in its further development. A text-book on the general subject of fruit culture is supplemented by lectures on the leading fruits, dealing with the kind of soil for fruits and its preparation, laying out the orchard, varieties, methods of propagation, planting, cultivation, fertilizing, pruning, harvesting, and marketing. Practical exercises are given in laboratory, orchards, and vineyards, which include budding, grafting, top-grafting; making of cuttings; pruning of fruit and ornamental trees; fruit bud studies; planting and transplanting; identification of varieties; packing; and handling of nursery stock. Three periods first term, one period second term. Mr. CRIDER.

**Vegetable Gardening.**—*Second Year:* This course treats of the trucking industry of the State and the growing of vegetables for home use. A text-book is used, supplemented by lectures on the growing, handling, and marketing of the leading vegetables. Practical exercises are given in the laboratory and field which include germinative tests of seeds; seed sowing; methods of transplanting and culture; manipulation of garden tools; construction and management of hot-beds and cold-frames, and protection of plants from insects. Three periods, third term. Mr. CRIDER.

**Plant Life.**—The structure of the leading types of plants is studied and the general principles of nutrition, growth, reproduction, are discussed in an elementary and practical way. Second year. Two periods, first term. Mr. NORTON.

**Diseases of Plants.**—Practical instruction will be given concerning the chief fungous and bacterial diseases attacking field, orchard, and garden crops; how to recognize them and how to prevent them, including instruction concerning the preparation of spraying mixtures. Second year. Three periods, second term. Professor FULTON.

**Animal Husbandry.**—Study of breeds, judging and management of live stock, animal breeding, and stock feeding. There will be lectures on all the above subjects, supplemented by practical work as far as possible. Second year. Three periods, first, second, and third terms. Professor McNUTT.

**Dairying.**—This course is designed to give a good working knowledge of farm dairy operations.

The student while in the dairy laboratory uses the leading makes of separators, churns, butter-workers, Babcock testers, etc., until he becomes familiar with their construction and proficient in operating them.

The laboratory course is supplemented by lectures of a practical nature, covering the most important features of dairying. It is a course of study which should meet the requirements of the farmer and dairymen who handle dairy products, whether for home use or for commercial purposes. Four periods, third term. Mr. SANBORN.

**Poultry Husbandry.**—Classification and study of the breeds of domestic poultry; breeding, feeding, and management; construction and location of poultry houses; production and marketing of eggs; production, killing, and marketing of poultry; capons and caponizing; incubation and brooding. Second year. Three periods, second and third terms. Mr. TAYLOR, Mr. ROSS.

**Veterinary Science.**—The lectures on this subject treat of elementary veterinary anatomy and physiology, the care of live stock to prevent diseases, and the treatment of some of the most common diseases. Second year. Three periods, first term. Doctor ROBERTS, Doctor KOONCE.

**Entomology.**—This is a short course in which the more noxious insects are studied, with special reference to methods of preventing their injuries. The various insecticides and methods of spraying are also included in this course. Two periods, second term; two periods, third term. Associate Professor METCALF.

**Physics.**—Properties of matter, fundamental units, British and metric standard measures, mechanics, liquids, gases, heat, introduc-

tion to light and sound. First year. Two periods a week, three terms. Assistant Professor MCINTYRE, MR. SOUTH.

**Algebra.**—Wells' *New Higher Algebra*. A thorough treatment of the fundamental conceptions and operations of Elementary Algebra, with special attention to factoring, fractions, simple equations, simultaneous equations in two or more unknowns, and problem solving. First and second terms. Five periods. Assistant Professor MANN, MR. HARRELSON, MR. TUCKER, MR. PITTS.

**Plane Geometry.**—This course begins the subject and completes three books, special attention being given to original exercises. Five periods, third term. Assistant Professor MANN, MR. HARRELSON, MR. PITTS, MR. TUCKER.

**English.**—This is a thoroughly practical course in the elements of grammar and of composition, especially spelling, sentence and paragraph structure, and letter-writing. Some reading is done in class, and supplementary reading also is assigned for private study. First year. Three periods a week. Doctor SUMMEY, MR. PRATT.

**Composition and Rhetoric.**—After a review of grammatical principles, especial attention is given to the selection of subjects and the planning of essays, to the choice of words, and to the structure of sentences and paragraphs. Standard poetry and prose are read in class, and additional books are assigned for parallel reading. Frequent short themes are written. Second year. Three periods. Professor HARRISON, Doctor SUMMEY, MR. PRATT.

**Wood Shop.**—The use and care of ordinary woodworking and bench tools. Exercises in sawing, planing, and making joints. As much time as possible is spent in making models of small buildings, gates, etc. First year, two periods. MR. WHEELER.

**Forge Shop.**—This course is designed to teach the use of the ordinary blacksmith's tools, and the making of the more common forgings, such as chains, hooks, etc. First term. MR. HUERT, MR. NICHOLS.

**Drill.**—Calisthenic exercises; bayonet exercises; military signaling; school of the soldier; squad, company, and battalion ceremonies, including inspection, parade, review, and guard mounting; guard duty; marches and minor tactics; gallery and range target practice. First and second years. Three hours each week for the first and second terms. Two hours each week required of all classes except Seniors. Captain PEACE and Cadet Officers of the Battalion.

## I (d). ONE-YEAR COURSE IN AGRICULTURE.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Agriculture.....	3	2	3
Soils and Fertilizers.....	3	3	--
Animal Husbandry.....	3	3	3
Dairying.....	--	--	4
Veterinary Science.....	3	--	--
Poultry Husbandry.....	--	3	3
Fruit Culture.....	3	1	--
Vegetable Gardening.....	--	--	3
Plant Life.....	2	--	--
Diseases of Plants.....	--	3	--
Entomology.....	--	2	2
Woodwork.....	2	2	2
English.....	3	3	3
Drill.....	3	3	2
Totals.....	25	25	25

## Subjects of Instruction.

**Agriculture.**—The course in Elementary Agriculture will consist of lectures and recitations on crops, farm equipment, and farm machinery. One period per week will be devoted to practical exercises, including the identification and habit of growth of farm crops and the drawing of plans for farms and farm buildings. The work will be made practical and will be suited to the needs of the student. Three periods, first term; two periods, second term; three periods, third term. Professor NEWMAN, Mr. HODSON.

**Soils and Fertilizers.**—This will include the study of the soils of the State, their formation and classification into agricultural types; their physical properties, relations to moisture and air supply; best methods of conserving and regulating the soil moisture; principles and practice of drainage; effect of different soil and crop treatments, such as rotation, cultivation, and fertilization. Considerable attention will be given to humus, farm manures and green manures, and the use and home-mixing of fertilizers, with special reference to the

time and methods of using and the best mixtures for the various crops on the different types of soil. Three periods, first and second terms. Professor SHERWIN.

**Animal Husbandry.**—Study of breeds, judging and management of live stock, animal breeding, and stock judging. There will be lectures on all the above subjects, supplemented by practical work as far as possible. Three periods, first, second, and third terms. Professor McNUTT.

**Dairying.**—This course is designed to give a good working knowledge of farm dairy operations.

The student while in the dairy laboratory uses the leading makes of separators, churns, butter-workers, Babcock testers, etc., until he becomes familiar with their construction and proficient in operating them.

The laboratory course is supplemented by lectures of a practical nature, covering the most important features of dairying. It is a course of study which should meet the requirements of the farmer and dairyman who handle dairy products, whether for home use or for commercial purposes. Four periods, third term. Mr. SANBORN.

**Veterinary Science.**—The lectures on this subject treat of elementary veterinary anatomy and physiology, the care of live stock to prevent diseases, and the treatment of some of the most common diseases. Three periods, first term. Doctor ROBERTS, Doctor KOONCE.

**Poultry Husbandry.**—Classification and study of the breeds of domestic poultry; breeding, feeding, and management; construction and location of poultry houses; production and marketing of eggs; production, killing, and marketing of poultry; capons and caponizing; incubation and brooding. Three periods, second and third terms. Mr. TAYLOR, Mr. ROSS.

**Fruit Culture.**—This course treats of fruit growing as applied to the different sections of the State and the possibilities embodied in its further development. A text-book on the general subject of fruit culture is supplemented by lectures on the leading fruits, dealing with the kind of soil for fruits and its preparation, laying out the orchard, varieties, methods of propagation, planting, cultivation, fertilizing, pruning, harvesting, and marketing. Practical exercises are given in laboratory, orchards, and vineyards, which include budding, grafting, top-grafting; making of cuttings; pruning of fruit and ornamental trees; fruit bud studies, planting and transplanting; identification of varieties; packing; and handling of nursery stock. Three periods, first term. Mr. CRIDER.

**Vegetable Gardening.**—This course treats of the trucking industry of the State, and the growing of vegetables for home use. A text-book is used, supplemented by lectures on the growing, handling, and marketing of the leading vegetables. Mr. CRIDER.

Practical exercises are given in the laboratory and field which include germinative tests of seeds; seed sowing; methods of transplanting and culture; manipulation of garden tools; construction and management of hotbeds and cold-frames, and protection of plants from insects. Three periods, third term. Mr. CRIDER.

**Diseases of Plants.**—Practical instruction will be given concerning the chief fungous and bacterial diseases attacking farm crops, fruit trees, etc.; how to recognize them and how to prevent them, including instruction concerning the preparation of spraying mixtures. Three periods, second term. Professor FULTON, Mr. NORTON.

**Plant Life.**—The structure of the leading types of plants is studied and the general principles of nutrition, growth, reproduction, are discussed in an elementary and practical way. Two periods, first term. Mr. NORTON, Mr. ROSENKRANS.

**Entomology.**—This is a short course in which the more noxious insects are studied, with special reference to methods of preventing their injuries. The various insecticides and methods of spraying are also included in this course. Two periods, second term; two periods, third term. Associate Professor METCALF.

**Wood Shop.**—The use and care of ordinary woodworking and bench tools. Exercises in sawing, planing, and making joints. As much time as possible is spent in making models of small buildings, gates, etc. Two hours the three terms. Mr. WHEELER.

**English.**—This is a thoroughly practical course in the elements of grammar and of composition, especially spelling, sentence and paragraph structure, and letter-writing. Some reading is done in class, and supplementary reading also is assigned for private study. Three hours a week. Required of one-year students. Doctor SUMMEY, Mr. PRATT.

**Drill.**—Callisthenic exercises; bayonet exercises; military signaling; school of the soldier; squad, company and battalion ceremonies, including inspection, parade, review, and guard mounting; guard duty; marches and minor tactics; gallery and range target practice. Three hours each week for the first and second terms. Two hours each week required of all classes except Seniors. Seniors may elect either the drill or three hours extra in some other subject in its place. Captain PEACE and Cadet Officers of the Battalion.



## WINTER SHORT COURSES IN AGRICULTURE.\*

### I (e). SIX-WEEKS COURSE IN GENERAL AGRICULTURE.

Begins January 7 and Ends February 18, 1914.

The College is frequently called upon to supply young men to take charge of farms of wealthy owners, and to operate dairies, fruit farms, truck and market gardens. The National Department of Agriculture, the State Experiment Stations, the Agricultural and Mechanical Colleges and the hundreds of commercial industries requiring scientifically trained men are eagerly seeking young men of such force and training as are given in the Agricultural and Mechanical Colleges. The demand is greater than the supply. The teaching of agriculture in the public schools and the organization of agricultural high schools, with agricultural instruction as an important feature, have met with a serious check for no other reason than that there are not enough trained teachers to supply the demand. This course is meant to help those (1) who want to cultivate their own farms with more knowledge and who want to keep informed as to recent improvements and recent farm literature; (2) who want to improve their teaching of agricultural subjects; (3) who want to specialize for a few weeks in some particular phase of farm industry.

#### EQUIPMENT.

Patterson Hall and the Animal Husbandry building are devoted entirely to agriculture, and contain laboratories and classrooms built and furnished especially for the purposes for which they are used. Equipment is constantly being added and facilities for instruction become better every year. The professors in each department of the School of Agriculture are specialists in their chosen work, and are devoting their lives to study and to methods of improving rural life.

#### EXPENSES.

No tuition is charged for the Six-weeks Course, and board may be had in the mess-hall for \$2.75 per week. The College will furnish lodging in the dormitories free if there is room. Room in the College buildings is very limited this year. Students who expect to room in the dormitories should provide themselves with bed cover, sheets, pillow-cases, and towels.

\*Details will be announced in Winter Course Circular, which is published in November of each year.

While engaged in work in the dairy laboratory, students are required to wear white suits. These suits may be had at \$1 apiece. The total expense of the course need not exceed \$25 over and above railroad fare.

#### ADMISSION.

No examinations are required for entrance to the Six-weeks Course. Any person over sixteen years of age may enter and enjoy the full privileges of the instruction. The greater part of the instruction is given in the form of lectures and laboratory work, and the full time of the student is provided for. Some of the evenings will be taken up by lectures on important subjects, and others by meetings of students for their mutual improvement.

The regular work of the Six-weeks Course begins January 7, but all should arrive the day before, in order that board and room may be arranged for, and so that each man may be ready for the work when it begins.

Should further information be desired, either the President or the Professor of Agriculture will take pleasure in furnishing it.

### OUTLINE OF SIX-WEEKS COURSES.

#### GENERAL AGRICULTURE.

Professor Newman and Mr. Hodson.

**Farm Crops.**—Selection of crops to be grown, and their economic relation to farm operations; preparation and cultivation; planting; seed selection and plant breeding on the farm; studies of the staple crops; corn, small grain, cotton, and legumes; special crops to be grown in association with the live-stock industry.

**Farm Equipment and Farm Management.**—Selection and laying out of farm; fences, roads, houses; tools and machinery; rotation; farming as a business.

#### SOILS AND FERTILIZERS.

Professor Sherwin.

This will include a study of the soils of the State; their formation and classification into Agricultural types; their physical properties; relation to moisture and air supply; best methods of conserving and regulating the soil moisture; principles and practices of drainage.

The effect of different soil and crop treatments, such as rotation, cultivation, and fertilization, will be studied. Considerable attention will be given to humus, farm manures and green manures, and to the

use and home-mixing of commercial fertilizers, with special reference to the time and methods of using and the best mixtures for special crops on different types of soil.

#### AGRICULTURAL BOTANY.

**Professor Fulton.**

This course will consist of the practical study of the diseases of plants, how to recognize them and how to prevent them; bacteria, their nature, their effects for good or harm in the farm home, and how to control them, and their function in the soil as nitrogen gatherers; the principles of plant nutrition; the cross-breeding of plants: how to accomplish it, its object, and the benefits to be derived therefrom.

#### BREEDS OF LIVE STOCK AND STOCK JUDGING.

**Professor McNutt and Mr. Sanborn.**

Lectures on this subject will treat of the characteristics of the different breeds of live stock.

The practical part of the work will be given in the judging-room, where the student is required to score the animals and pass upon their respective merits.

#### FEEDS AND FEEDING AND STOCK RAISING.

**Professor McNutt.**

Lectures on this subject will treat of the composition and digestibility of home-grown and commercial feeds, methods of calculating rations for different classes of farm animals, and suggestions as to the best and most economical feeds for the different classes of live stock.

An outline will also be given of the care and management of the most prominent breeds of live stock.

#### DAIRY FARMING.

**Mr. Sanborn.**

Lectures are given on the nature, composition, and secretion of milk; its uses and value as a food; the production and care of sanitary milk; management of dairy herd; details in the production of high-grade cream and butter; the marketing of dairy products, and their value when sold as milk, cream, butter, and cheese.

The dairy laboratory course, given in connection with the farm dairy lecture course, consists of twenty-four periods of two hours each, and comprises every detail of dairy work, butter-making, re-

talling milk, making cottage cheese, and skim-milk, buttermilk, pasteurizing milk and cream, making and using starters, and making tests of all sorts of dairy products, and standardizing milk and cream.

#### DAIRY EQUIPMENT.

The dairy laboratories occupy about 4,000 feet of floor space on the ground floor of Patterson Hall, besides the locker-rooms, toilet and bathrooms on the same floor, and the dairy lecture-room on the first floor, used by dairy students.

The main laboratory is 33 x 57 feet, and is fitted throughout with modern equipment, suited to giving up-to-date instruction in farm dairying, retailing milk, and creamery practice. The equipment for farm dairying consists in the main of De Laval, Sharples, Empire, National, and Simplex separators; swing and barrel hand churns of different sizes; cream vats; hand and power butter-workers; aerators and coolers; milk testers, and other articles useful in doing farm dairy work.

Recently a new dairy barn has been erected which is a model in dairy-barn construction, embodying every feature that goes to make a barn convenient and sanitary.

#### DISEASES OF LIVE STOCK.

**Doctors Roberts and Simms.**

To maintain the usefulness of animals and to advance the live-stock interests, all who handle live stock should have some knowledge of the causes of disease and the nursing of sick animals.

A general conception of the structures of the body and their uses being essential to competent judging and feeding of animals, as well as to a knowledge of disease, a short time will be given to this subject. The structures will be divided into groups, so that in a limited time one may gain a fair idea of the composition of the body. Comparisons will be made of the structures of the various farm animals with those of man. Mounted skeletons of the horse, cow, and man, in the lecture-room, enable the student readily to become familiar with this part of the body.

The lectures will include the care and management of live stock to prevent disease, and the nature, causes, and treatment of the more common diseases and injuries.

One period each week will be devoted to a clinic where animals will be treated medically and operated upon. During the course there will be a practical demonstration of the tuberculin test upon the dairy herd.

**HORTICULTURE.****Professor Pillsbury and Mr. Crider.**

The course includes both lectures and field work, and is made especially applicable to North Carolina conditions.

**Fruit Culture.**—This includes a discussion of the fruit sections of the State, and the possibilities of fruit-growing in each section. This is followed by lectures on the culture of our leading fruits, which deal with the kind of soil, preparation of soils for fruits, and with varieties, planting, cultivation, fertilization, pruning, harvesting, and marketing. Special emphasis is laid on the home fruit garden.

**Vegetable Gardening.**—Lectures on the best methods of growing the leading vegetables for market and home use.

**Laboratory Work.**—Practice in plant propagation, such as budding, grafting, top grafting, pruning of fruit and ornamental trees; fruit-bud studies; planting and transplanting of trees and vegetables; construction of cold-frames and hotbeds.

**Equipment.**—The Horticultural Department is well equipped for this work. The College has a very complete fruit plantation, which includes all the standard varieties of the following fruits: apple, pear, peach, plum, cherry, quince, persimmon, pecan, fig, muscadine grapes, fox grapes, raspberries, dewberries, and strawberries; also a nursery, where various methods of budding and grafting are carried on.

**ENTOMOLOGY.****Associate Professor Metcalf.**

The course in Entomology is intended to teach students the general facts concerning the common injurious and beneficial insects, with which every one should be familiar.

Insect injury to farm crops, fruit, and vegetables amounts annually to thousands and even millions of dollars. A conservative estimate has shown that fully ten per cent of the values of all agricultural products is destroyed each year, and yet there are many farmers who know very little of the habits and life-history of the most common insects. We should know how insects pass the winter, when they are most easily destroyed or prevented, and the best methods of combating them.

The course will consist of a number of lectures, illustrated by specimens, photographs, and charts, to familiarize the student with the principal insects affecting general farm crops and fruit trees. Field observations will be made to study insects that may be found during January and February. The preparation and application of various spray mixtures for controlling insects, including the use of spraying apparatus, will be made a special feature of the work.

**POULTRY RAISING.****Mr. Taylor and Mr. Ross.**

The subject of poultry raising will be considered from the farm standpoint. Instruction will include lectures and work with the fowls. Students will be told what to do and how to do it, and will also be required to do the work.

Instruction will be given in poultry-house construction, the breeds of fowls best suited to the farm, and their breeding, feeding, and management. Egg production and the production of market poultry will receive special attention. The former will be considered both from the standpoint of breeding and feeding, and the results obtained at our own and other Experiment Stations will be discussed. Market poultry will include the production of broiler or frying-size chickens, roasters, and capons. Incubation and brooding, both natural and artificial, will also be studied.

The Poultry Department is equipped with thirty breeding pens of several different types; a good incubator cellar, and several different makes of incubators; a brooder-house and both indoor and outdoor brooders of both the heated and fireless types. Good specimens of eleven different varieties of poultry best suited to farm requirements are kept so that students may become familiar with the requirements of the different breeds.

Students wanting to specialize in poultry will be given extra work in this department, taking charge of a pen of fowls, operating an incubator, raising chicks in a brooder, and keeping all the records necessary in poultry work.

**AGRICULTURAL EXTENSION.**

The Department of Agricultural Extension was organized July 1, 1909. This department was and is made possible by the help of the General Educational Board in the United States. The work is closely correlated with that of the United States Department of Agriculture. The object of this department is to link the scientific agricultural work of the College and Station to the practical work on the farms of the State. Each year the trained scientific workers of America add to the fund of information needed by progressive farmers. The object of this department is to carry this information to the busy men on the farm, and to help in the teaching of farm science in our schools. This is done by addresses to farmers, by farm schools held in different sections, holding seed-corn days, organizing boys' corn clubs, and in such other ways as time and occasion may permit. PROFESSOR I. O. SCHAUB.

## II. ENGINEERING COURSES.

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- a. Four-year Course in Civil Engineering.
- b. Four-year Course in Mechanical Engineering.
- c. Two-year Course in Mechanic Arts.
- d. Four-year Course in Electrical Engineering.
- e. Four-year Course in Chemistry.

### COURSE IN CIVIL ENGINEERING.

The aim of the course in Civil Engineering is to give such training as will enable our young men to take an active part in the work of advancing our State along material lines—developing its water-power, building railroads and public highways, constructing water supply and sewerage systems for our towns, etc. The student is given a large amount of practical work in the field and draughting-room, and acquires a fair degree of efficiency in the use of the various surveying instruments, and in draughting. At the same time it is recognized that a successful engineer requires a well-trained mind—one that reasons logically, accurately, and quickly. Therefore a thorough course is given in all those branches of applied mathematics which are involved in the solution of engineering problems.

The aim has been to make this preëminently a technical course; but subjects of general culture are included in order to give the student a broader mental training and better preparation for social and business life.

#### Civil Engineering Equipment.

There is a complete equipment of all instruments necessary to civil engineering field work. The classrooms, drawing-rooms, and laboratories are in Winston Hall.

II (a). The Four-year Course in Civil Engineering, leading to the degree of Bachelor of Engineering.

Freshman Year.

SUBJECTS.	PERIODS A WEEK.*		
	1st Term.	2d Term.	3d Term.
Mechanical Drawing, 230†.....	2	2	2
Woodwork, 235.....	2	2	2
Forge Work, 236.....	..	2	2
Shop Lectures, 253.....	2	..	..
Algebra, 340.....	5	3	..
Geometry, 341.....	..	2	5
Physics, 280.....	4	4	4
Physical Laboratory, 282.....	1	1	1
Composition and Rhetoric, 360.....	3	..	..
American Literature, 361.....	..	3	3
Military Drill, 390.....	3	3	2
Totals.....	22	22	21

Sophomore Year.

Architecture, 220.....	2	..	..
Architectural Drawing, 221.....	2	2	2
Geometry, 342.....	5	..	..
Advanced Algebra, 343.....	..	3	..
Trigonometry, 344.....	..	2	5
Descriptive Geometry, 200.....	..	2	2
Physics, 281.....	2	2	2
Inorganic Chemistry, 300.....	3	3	3
Inorganic Chemistry (laboratory), 301.....	2	2	2
Advanced Rhetoric, 362.....	3	3	..
Public Speaking, 363.....	..	..	3
Military Drill, 390.....	3	3	2
Military Tactics, 391.....	1	1	1
Totals.....	23	23	22

\*The lecture and recitation periods are one hour; the laboratory, shop, and other practice periods, two hours.

†The figures immediately following the name of the study are given to aid one in finding readily a description of the subject. Under each department a number precedes the description of the study.



## Junior Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Road Building, 212.....	1	1	1
Surveying, 202, 206.....	2	2	2
Surveying (field work), 207.....	2	2	2
Construction, 205.....	2	..	..
Topographical Drawing, 200, 203.....	2	2	2
Graphic Statics, 201.....	..	2	2
Mechanics, 204.....	3	3	3
Analytical Geometry, 345.....	5	2	..
Calculus, 236.....	..	3	5
English Literature, 364.....	3	3	3
Military Drill, 390.....	3	3	2
Spanish (elective), 372.....	3	3	3
Totals.....	23	23	22

## Senior Year.

Mechanics of Materials, 214.....	3	..	..
Roofs and Bridges, 209.....	3	..	..
Bridge Design, 210.....	..	3	3
Municipal Engineering, 211.....	..	2	2
Surveying (field work), 208.....	2	..	..
Hydraulics, 216.....	..	2	2
Calculus, 346.....	3	..	..
Railroad Engineering, 206.....	3	3	3
Reinforced Concrete, 214.....	..	2	2
Astronomy, 212.....	..	2	2
Laboratory, 217.....	..	2	2
Mechanics, 203.....	2	..	..
Journals, 365.....	2	..	..
Classics, 366.....	..	2	2
Economics, 367.....	1	1	1
Elect one of the following:			
Military Drill, 390.....	3	3	2
Modern Languages, 370, 372.....	3	3	3
Totals.....	22	22	22

## Subjects of Instruction.

**200. Descriptive Geometry, Stereotomy.**—Text-book, lectures, problems, and completed drawings. Two periods, second and third terms. Required of Sophomores in Civil Engineering. Mr. POOLE.

**201. Graphic Statics.**—Determination of stresses in frame structures by graphical methods. Lectures and original problems. Two periods, second and third terms. Required of Juniors in Civil Engineering. Assistant Professor MANN.

**202. Surveying.**—Land surveying, leveling, elements of triangulation, topographical surveying, roadmaking. Two periods, first term. Required of Juniors in Civil Engineering. Assistant Professor MANN.

**203. Topographical Drawing.**—Conventional signs, computations, forms of field notes, methods of platting, completed map from field notes. Two periods. Required of Juniors in Civil Engineering. Assistant Professor MANN.

**204. Mechanics.**—Nature and measurement of forces, moments, conditions of equilibrium, moment of inertia, laws of motion, constraining and accelerating forces, dynamics of a rigid body, momentum and impact, work, power, friction, application of principles to various engineering problems. Three periods. Required of Juniors in Civil Engineering. Two periods, first term. Required of Seniors. Professor RIDDICK, Mr. TUCKER.

**205. Construction.**—Masonry, foundations, railroads, dams, retaining walls, arches, etc. Baker's *Masonry Construction*. Lectures. Two periods, first term. Required of Juniors in Civil Engineering. Assistant Professor MANN.

**206. Railroad Engineering.**—Reconnaissance, preliminary and location surveys, cross-sections, compound curves, spirals, etc. Searles' *Field Engineering*. Two periods, second and third terms. Required of Juniors in Civil Engineering. Three periods. Required of Seniors in Civil Engineering. Assistant Professor MANN.

**207. Surveying.**—Field work. Use of instruments, compass, level, transit, and plane table. Practical work in land surveying, topography, leveling, railroad surveying, working up notes, and platting. Two periods. Required of Juniors in Civil Engineering. Assistant Professor MANN, Mr. POOLE, Mr. TUCKER.

**208. Surveying.**—Field work. Triangulation and topography, use of sextant and plane table, surveys for sewers, waterworks, etc. Two periods, first term. Required of Seniors in Civil Engineering. Assistant Professor MANN, Mr. POOLE, Mr. TUCKER.

**209. Roofs and Bridges.**—Determination of stresses in roof and bridge trusses by the analytical method. Merriman's *Roofs and Bridges*. Original problems. Three periods, first term. Required of Seniors in Civil Engineering. Mr. POOLE.

210. **Bridge Design.**—Calculation of stresses, design, specifications, and estimate of cost of a wooden rooftruss and a steel railway bridge. Three periods, second and third terms. Required of Seniors in Civil Engineering. Professor RIDDICK.

211. **Municipal Engineering.**—Text-books, lectures. Two periods, second and third terms. Required of Seniors in Civil Engineering. Professor RIDDICK.

212. **Road Building.**—Text-book on construction of roads, streets and pavements. Lectures on practical roadmaking in North Carolina. One period. Required of Juniors in Civil Engineering. Professor RIDDICK.

213. **Astronomy.**—Determination of azimuth, latitude and longitude, and time. Comstock's *Astronomy for Civil Engineers*. Two periods, second and third terms. Required of Seniors in Civil Engineering. Professor RIDDICK.

214. **Reinforced Concrete.**—Turneaure & Maurer's *General Theory of Concrete and Steel Construction*. Problems in beams, columns, retaining walls, etc. Two periods, second and third terms. Required of Seniors in Civil Engineering. Assistant Professor MANN.

215. **Mechanics of Materials.**—Study of stresses in beams, columns, shafts, etc. Merriman's *Mechanics of Materials*. Three periods, first term. Required of Seniors in Civil Engineering. Professor RIDDICK.

216. **Hydraulics.**—Methods of measuring flow of streams, laws governing flow in pipes and conduits, determination of water-power in streams, testing of hydraulic motors. Text-book, Merriman's *Hydraulics*. Two periods, second and third terms. Required of Seniors in Civil Engineering. Two periods, second and third terms. Required of Seniors in Mechanical and Electrical Engineering. Professor RIDDICK.

217. **Laboratory.**—Tests of cement and other materials. Hydraulic measurements. Two periods, second and third terms. Required of Seniors in Civil Engineering. Assistant Professor MANN, Mr. POOLE.

## ARCHITECTURE.

220. **Architecture.**—Building materials, methods of constructing buildings, plans, specifications, bill of materials, estimate of cost, design of buildings. Lectures. Two periods, first term. Required of Sophomores in Civil Engineering. Mr. POOLE.

221. **Architectural Drawing.**—Drawings from a building already constructed, design of a dwelling, detail and perspective drawings. Two periods. Required of Sophomores in Civil Engineering. Mr. POOLE.

## FOUR-YEAR COURSE IN MECHANICAL ENGINEERING.

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The regular four-year course in Mechanical Engineering offers a training in the fundamental principles of design, construction, manufacture, and operation of all classes of standard and special machinery, and their economic application to railroads, steamships, mills, shops, factories, and power plants, as well as in the technical and executive management of the manufacturing and transportation industries. To this end the course of instruction is as broad as is possible to give in a technical school.

The course begins with a thorough training in mathematics, physics, and chemistry as a foundation for the appropriate technical work which is developed along several parallel lines. Applications of these fundamental sciences to the physical properties of the materials of construction, especially the metals and their practical manipulation, lead through the courses in mechanics, resistance of materials, shop processes, the materials-testing laboratory, drafting and kinematics, to the principles of design, which are fixed by application to the design of machinery for the execution of any kind of process in which machinery is either absolutely essential or more economical than corresponding hand execution of the same process. The principles underlying the performance of machinery are developed by courses in thermodynamics, mechanics, and hydraulics, with experimental laboratory demonstrations. The instruction in the performance, design, and manufacture of machine and power units in the classroom and laboratory, supplemented by visits to power plants and factories, is the basis of the work on the design of plants and mills.

To success in any one of these particular branches or phases of this profession a thorough technical training is absolutely indispensable, for it supplies the broad, general foundation, which must in its turn be supplemented by practical experience and by contact with the special line of work chosen.

**II b. The Four-year Course in Mechanical Engineering, leading to the degree of Bachelor of Engineering.**

**Freshman Year.**

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Mechanical Drawing, 230.....	2	2	2
Woodwork, 235.....	2	2	2
Forge Work, 236.....	..	2	2
Shop Lectures, 253.....	2	..	..
Algebra, 340.....	5	3	..
Geometry, 341.....	..	2	5
Physics, 230.....	4	4	4
Physical Laboratory, 282.....	1	1	1
Composition and Rhetoric, 300.....	3	..	..
American Literature, 361.....	..	3	3
Military Drill, 300.....	3	3	3
Totals.....	22	22	22

**Sophomore Year.**

Descriptive Geometry, 231.....	2	..	..
Mechanical Drawing, 232.....	..	2	2
Foundry, 237.....	2	..	..
Pattern-making, 238.....	..	2	2
Geometry, 342.....	5	..	..
Advanced Algebra, 343.....	..	3	..
Trigonometry, 344.....	..	2	5
Physics, 281.....	2	2	2
Physical Laboratory, 283.....	1	1	1
Inorganic Chemistry, 300.....	3	3	3
Inorganic Chemistry (laboratory), 301.....	2	2	2
Advanced Rhetoric, 362.....	3	3	..
Public Speaking, 363.....	..	..	3
Military Drill, 300.....	3	3	2
Military Tactics, 391.....	1	1	1
Totals.....	24	24	23

## Junior Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Steam Engines and Boilers, 241.....	3	3	3
Mechanics, 250.....	2	2	2
Machine Design, 233.....	2	2	2
Machine-shop, 239.....	2	2	2
Electrical Engineering, 285.....	2	2	2
Electrical Laboratory, 290.....	1	1	1
Analytical Geometry, 345.....	5	2	--
Calculus, 346.....	--	3	5
English Literature, 364.....	3	3	3
Military Drill, 360.....	3	3	2
German (elective), 370.....	3	3	3
Totals.....	23	23	22

## Senior Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Applied Mechanics, 251.....	3	--	--
Mechanics of Materials, 252.....	--	2	2
Machine Design, 234.....	3	2	2
Machine-shop Work, 240.....	2	2	2
Power Plants, 243.....	3	3	--
Gas Engines, 244.....	3	--	--
Industrial Engineering, 245.....	--	2	1
Power Transmission, 242.....	--	--	2
Heating, Ventilation, and Refrigeration, 247.....	--	2	3
Power-plant Design, 248.....	--	2	2
Surveying, 246.....	--	--	1
Steam Engineering Laboratory, 249.....	2	2	2
Calculus, 346.....	3	--	--
Hydraulics, 215.....	--	2	2
Elect three periods from the following:			
Military Drill, 390.....	3	3	2
Modern Languages, 370, 371, 372.....	3	3	3
Journals, 365.....	2	--	--
Classics, 366.....	--	2	2
Economics, 367.....	1	1	1
Totals.....	22	22	22

## MECHANICAL ENGINEERING EQUIPMENT.

**Buildings.**—The drawing-rooms, recitation-rooms, the forge shop, wood shop, machine shop, and mechanical laboratory are in the Mechanical Building. The Power Plant is also utilized for experimental engineering. The building formerly used as a kitchen is now used as a foundry.

**Drawing-rooms.**—There are two of these, one accommodating the Freshmen, the other those in the higher classes. These are equipped with drawing tables, board and filing cabinets, models of valves, pumps, machine parts, etc., etc. They are well lighted, heated, and ventilated, and are well adapted to the work.

**Forge Shop.**—This well-lighted and ventilated room is 30 x 40 feet. It is equipped with twenty-eight forges, blast being furnished from a Sturtevant blower; two emery and two buffing wheels; a Buffalo Forge Company's hand drill; an overhead exhaust system operated by a 60-inch Sturtevant exhaust fan, for removing smoke and gases from the fires; anvils and all necessary hand tools.

**Wood Shop.**—The woodworking equipment consists of fifteen double carpenters' benches which accommodate thirty students, and all necessary tools for each bench; thirty 12-inch turning lathes, each lathe being fully equipped with turning tools; a rip and a cut-off saw bench, foot-feed, with dado attachment; a double revolving rip and cut-off saw bench, with dado attachment; a 20-inch surface planer; a 12-inch hand-jointer or buzz planer; a universal boring machine; a 6½-inch tenoning machine with cope heads; a 6-inch sash and blind sticker; a 34-inch band saw; an iron frame self-contained jig-saw; a shaper or edge-moulding machine, with a very complete set of moulding cutters; a chain mortiser; a dovetailing machine; a belt sanding machine; a hollow chisel mortiser; a planer knife grinder; a 38-inch grindstone; a wood trimmer; an adjustable miter box; a steam glue-heater, and a large assortment of screw and bar clamps, both iron and wooden.

**Machine Shop.**—This contains a 16-inch Davis & Egan lathe with 10-foot bed, a 14-inch Windsor lathe with 5-foot bed, a 13-inch Barnes lathe with 5-foot bed, a 14-inch Putnam lathe with a 4-foot bed, a 14-inch Champion lathe with 6-foot bed, a 14-inch Flatner lathe with a 6-foot bed, three 14-inch lathes with 6-foot beds (built in College shops by students), a 26-inch by 44-inch by 12-foot bed McCabe double-spindle lathe, a 14-inch Champion lathe, a 12-inch Seneca Falls lathe, a 16-inch Gould and Eberhard shaper, an 18-inch Prentiss shaper, a 24-inch upright Bickford drill press, 32-inch American drill press, a Brown & Sharpe universal milling machine with all attachments, a 20-inch by 5-foot Pease planer, one large and one small emery tool-grinding machine, a Greenwich arbor press, an electric center grinder, a Whiton centering machine, and a twist-drill grinder. The machines have full equipment of chucks, rests and tools. The benches are well provided with vises.

**Foundry.**—This will accommodate about thirty students at one time. The floor is 30 x 60 feet, and the equipment consists of a Northern Engineering Works 36-inch cupola, with blast furnished by a Buffalo blower, a Griffen oil-burning furnace with air furnished by a No. 0 Sturtevant high-pressure blower, and oil by a Gould triplex pump. There is also a crucible brass furnace of good size. For moulding machines the foundry is equipped with an Arcade squeezer and a



Model moulding machine, both made by the Arcade Manufacturing Company and a Pridmore moulding machine made by Henry Pridmore. A Cadet core oven and all necessary tools for bench and floor work complete the equipment.

**Laboratory.**—This department is fairly well equipped with the necessary apparatus for performing commercial tests on the various mechanical engineering problems.

For general laboratory there are various measuring instruments, thermometers, pyrometers, steam-engine indicators, planimeters, tachometers, pressure and vacuum gages, a Crosby gage tester, steam calorimeters, both throttling and separating, an Emerson fuel calorimeter for testing coal and oils, apparatus for testing oil for flash point, burning point and viscosity, an apparatus for flue-gas analysis and apparatus rigged for making calibration tests on thermometers, indicator springs, and steam gages.

For the work in steam engineering there are the following: A 40-horse-power Skinner automatic engine, to which is connected a Wheeler surface condenser with a Blake air pump; a 25-horse-power steam engine; a 10-horse-power engine; apparatus arranged for making tests on injectors, pumps, flow of fluids through orifices and nozzles. Besides the above, which are used only for experimental purposes, the College power plant with a 100-horse-power Skinner automatic steam engine, a 135-horse-power DeLaval steam turbine, with all auxiliaries, as well as the boiler equipment—consisting of two 200-horse-power Atlas and two 75-horse-power Babcock and Wilcox water tube boilers—are all available for tests.

For making efficiency and economy tests on gasoline and oil engines, the following equipment is available: One 11-horse-power Foss gasoline engine, one 2-horse-power International Harvester Company gasoline engine, one 2-horse-power McVicker gasoline engine, one 16-horse-power Ford automobile engine, and a 1-horse-power engine built in the shops. To this collection it is hoped to add one or two oil engines in the near future.

For the course in testing of materials the following is available: a 500,000-pound Richlé automatic testing machine arranged for tensional, compression, and transverse tests; a 15,000-pound Olsen testing machine for small specimens, and necessary auxiliary apparatus, such as micrometers, extensometers, etc., for obtaining results of the various tests.

#### SUBJECTS OF INSTRUCTION.

**230. Mechanical Drawing.**—Instruction in care and use of instruments; lettering, geometrical drawing; projecting drawing; isometric and cabinet projections; drawings from working sketches of machine

details; tracing; blueprinting; elements of descriptive geometry; cylinders; cones; prisms; intersections and development; miscellaneous problems. Two periods. Required of Freshmen. Mr. COBURN.

**Note.**—Each student will be required to furnish, at his own expense, the following outfit. To insure uniformity in grade of instruments and other supplies the department keeps for sale practically at cost the articles named below. These may be purchased elsewhere, but must be approved by the department. Estimated cost of outfit \$12 to \$15.

Text-book.

Drawing board, 22 x 32 inches.

T-square, 30 inches.

60° triangle, 9 inches, transparent.

45° triangle, 7 inches, transparent.

12-inch triangular architect's scale.

4 H pencil. H or F pencil.

Erasers for ink and pencil.

Penholder with fine points.

Pencil sharpener.

Instrument set consisting of:

6-inch compass with pen, pencil, and lengthening bar.

5½-inch dividers with hairspring adjustment.

3-inch bow dividers, 3-inch bow pencil, 3-inch bow pen.

5½-inch ruling pen, 4½-inch ruling pen.

**231. Descriptive Geometry.**—General definitions; third angle; representation of points, lines, and planes; profile plane; projected views; line and plane essentials; relations of points, lines, and planes in-space; intersection of lines and planes; curved surfaces; development of surfaces; plane sections of solids. During the term many practical problems are given for solution and construction. Two periods. Required of Sophomores in Mechanical and Electrical Engineering. Prerequisite, Mechanical Drawing 230. Professor SATERFIELD, Mr. MORRIS.

**232. Mechanical Drawing.**—Making drawings and calculations setting forth the general principles of Descriptive Geometry. The design of cams to give specified motions and problems in elementary machine design. Two periods, second and third terms. Required of Sophomores in Mechanical and Electrical Engineering. Prerequisites, Mechanical Drawing 230 and Descriptive Geometry 231. Mr. MORRIS.

**233. Machine Design.**—A study of materials used in machine construction; analysis of stresses in machine parts; design of machine parts, considering them as compression, tension, or torsion members; modification of the above to suit practice and for the sake of general appearance. Design of simple machines, such as shears, punches, air hoists, riveters, etc., all calculations to be made in standard form and handed in with the assigned problem. Two periods throughout the year. Required of Juniors in Mechanical and Electrical Engineering. Prerequisites, Descriptive Geometry 231 and Mechanical Drawing 230 and 232. Assistant Professor ELLIS.

**234. Machine Design.**—Advanced Machine Design based on the thermal and mechanical problems involved in the design of a steam engine for power, economy, and regulation. The students are given the requirements of the engine—such as speed, regulation and point of cut-off for required horse-power—and are required to make calculations for the same; draw all theoretical diagrams from the Ideal indicator card to the rectified tangential pressure diagrams; valve diagrams, showing different events of valve; details of cylinder, frame, fly-wheel, governor, etc. Three periods, first term; two periods, second and third terms. Required of Seniors in Mechanical Engineering. Prerequisites, Machine Design 233, Mechanics 250, and Heat Engines 241. Assistant Professor ELLIS.

**235. Woodwork.**—The use and care of the ordinary woodworking bench tools. Exercises in laying out and working from drawings, sawing, planing, and making of joints. The use and care of woodworking machines such as saws, planers, shapers, dovetailers, tenoners, etc. Exercises in wood-turning. Work on repairs about the College. Two periods. Required of Freshmen and first-year Short Course. Mr. WHEELER.

**236. Forge Work.**—Treatment of iron and steel, the uses of the fuller, swage, punch and set hammer; drawing and upsetting; butt, scarf, and jump welding; making of forge and machine shop tools, with tempering of tool steel; exercises on power hammer. Special work on equipment and repairs about the College. Required of Freshmen and first-year Short Course. Two periods, recitations and exercises, second and third terms. Mr. HURTT, Mr. NICHOLS.

**237. Foundry.**—Recitations and exercises in foundry work, including working condition of the sand, use and care of tools, moulding, core-making, management of cupola and crucible furnaces in iron and brass melting. Required of Sophomores in Mechanical and Electrical Engineering and second-year Short Course. Two periods, first term. Mr. HURTT, Mr. NICHOLS.

**238. Pattern-making.**—A study of pattern-making in its relation to moulding; the practical construction of patterns to prevent warping and twisting; the making of special patterns; cores and core-boxes; introducing draft, shrinkage, finish, and the appliances and usages of modern pattern work. Required of Sophomores in Mechanical and Electrical Engineering. Two periods, second and third terms. Prerequisite, Woodwork, 235. Mr. WHEELER.

**239. Machine-shop Work.**—Bench and machine work. Exercises in chipping and filing. Exercises in lathe work, boring, reaming, drilling, planing, milling and shaper work. Two periods. Required of Juniors in Mechanical Engineering. One period. Required of Juniors in Electrical Engineering. Mr. PARK.

**240. Machine-shop Work.**—Making the parts of some machine, or of an engine. Making tools, such as taps and reamers. Laying out work. Working from drawings, duplicate and interchangeable parts. Working to standard gauges. Two periods. Required of Seniors in Mechanical Engineering. Mr. PARK.

**241. Heat Engines.**—A study of elementary thermodynamics, properties of steam, calorimeters and mechanical mixtures, combustion and fuels, boilers and boiler auxiliaries, steam engines, including types and details, valve gears, and governors; layout and necessary calculations for steam-engine testing, condensers, and air pumps, steam turbines, gas engines, and economy of heat engines. Three periods throughout the year, required of Juniors in Mechanical Engineering. Two periods throughout the year, required of Juniors in Electrical and Textile Engineering. Prerequisites, Physics 281 and Advanced Algebra 343. Professor SATTERFIELD, Mr. VAUGHAN.

**242. Transmission of Power.**—This work includes a study of the methods employed for the transmission and measurements of power in machine shops and factories, and review of experiments which have been made to determine the efficiency of the various systems of power-transmission machinery. Two periods, third term. Required of Seniors in Mechanical Engineering. Professor SATTERFIELD.

**243. Mechanical Engineering of Power Plants.**—A critical study of steam boilers and furnaces, of boiler-room accessories, of coal and ash handling, and of piping, steam engines, steam turbines, pumps, condensers, traps, separators, etc. Special attention is paid to the conditions under which different equipment would be used, and to the selection of the apparatus, also to the cost of power, depreciation, repairs, etc. Three periods, first and second terms. Required of Seniors in Mechanical Engineering. Professor SATTERFIELD.

**244. Gas Engines.**—Thermodynamics of the gas engine, theoretical comparisons of various types of internal combustion engines. Com-

bustion, including combining weights and volumes, heating value, air required, etc. Gas-engine fuels; solid, liquid, and gas. Gas producers, carburetors, and vaporizers. The fuel mixture, pressure, and temperature resulting from combustion. Modern types of internal combustion engines, auxiliaries, including ignition, starting apparatus, and mufflers; regulation, efficiency, and economy. Three periods, first term. Required of Seniors in Mechanical Engineering. Prerequisites, Heat Engines 241 and Mechanics 250. Mr. VAUGHAN.

245. **Industrial Engineering.**—A study of the origin and principles of the Industrial System; the nature and distribution of expense; labor; materials, etc. Two periods, second term, and one period third term. Required of Seniors in Mechanical Engineering. Professor SATTERFIELD.

246. **Surveying.**—A brief course teaching the use of the level and transit in locating buildings, laying out foundations, and lining out shafting, engines, and machinery. One period, third term. Required of Seniors in Mechanical Engineering. Assistant Professor MANN, Mr. POOLE, Mr. TUCKER.

247. **Heating, Ventilation, and Refrigeration.**—This subject treats of the various methods of heating, such as by open fires, hot air, steam and hot water; of the proper ventilation of all types of buildings; of methods of utilizing the waste heat from power plants for the heating of buildings; of the various types of ice-making and refrigerating machinery, and their installation, care, and management; and of the cost of heating and cooling. Two periods, second term; three periods, third term. Required of Seniors in Mechanical Engineering. Professor SATTERFIELD.

248. **Power Plant Design.**—A study of the selection, location, and proportioning of the essential details of steam and gas power plants, such as engines, boilers, pumps, piping, condensers, feed water heaters, chimneys, etc. The course consists of the study of references, lectures on the subject, and the drawing of plans of plants showing all details. Two periods, second and third terms. Required of Seniors in Mechanical Engineering. Prerequisite, Heat Engines 241. Assistant Professor ELLIS, Mr. VAUGHAN.

249. **Steam Engineering Laboratory.**—Calibration of the various instruments used in performing tests on various mechanical engineering problems. Practice in the use of calorimeters, both steam and fuel; indicators, planimeters, etc. Testing of lubricants for flash point, burning point, and viscosity. Checking the formulas used in determining the flow of fluids through orifices and nozzles. Efficiency tests of boilers, steam engines, injectors, pumps, and gasoline and oil engines. Testing of materials used in engineering construction. Two

periods throughout the year. Required of Seniors in Mechanical Engineering. One period throughout the year. Required of Seniors in Electrical Engineering. Prerequisites, Heat Engines 241 and Mechanics 250. Mr. VAUGHAN, Mr. MORRIS.

250. **Mechanics.**—Nature and measurement of forces, moments, conditions of equilibrium, moment of inertia, laws of motion, constraining and accelerating forces, momentum and impact, work, power, friction, application of principles to various engineering problems. Elasticity and mechanics of fluids. Preparatory to Applied Mechanics 251. Two periods throughout year. Required of Juniors in Mechanical and Electrical Engineering. Prerequisites, Physics 280, Algebra 340, and Trigonometry 344. Mr. VAUGHAN.

251. **Applied Mechanics.**—A study of the laws of equilibrium and motion as applied to a particle or to a rigid body; analytic treatment of stresses in structures; center of gravity, moment of inertia, energy and work, friction and dynamics of machinery. Three periods, first term. Required of Seniors in Mechanical and Electrical Engineering. Prerequisites, Mechanics 250. Assistant Professor ELLIS.

252. **Mechanics of Materials.**—A study of the effects of loads and forces in engineering structures by use of the stress-strain diagram. Determination of ultimate stress and elastic limit of materials, with investigation for maximum and minimum bending moment and shear. Torsion and its application to shafting, with theories as to elastic limit and failure. Two periods, second and third terms. Required of Seniors in Mechanical and Electrical Engineering. Prerequisites, Mechanics 250 and 251. Assistant Professor ELLIS.

253. **Shop Lectures.**—A series of lectures and recitations on the construction and use of woodworking tools and machinery; on the lumbering industry and preparation of lumber; on foundry and forge practice; on pattern-making; on shop equipment in general, labor-saving devices, etc., etc. Required of Freshmen in Civil, Electrical, and Mechanical Engineering. Two periods, first term. Professor SATTERFIELD and Assistants.

## MECHANIC ARTS.

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In order to meet the necessities of young men who wish to prepare themselves for the industrial arts rather than for industrial science and art, the following two-year course in Mechanic Arts is offered.

This course does not lead to graduation, and it is not, in any sense, intended as a preparatory course for the regular four-year classes. It is designed simply to help young men better fit themselves, by a year or two of practical work under competent and interested supervision, for their chosen sphere of industrial activity.

Those students whose inclinations, limitations, or necessities lead them to take this course will be carefully drilled in the handicraft of their art, and in the application of elementary science to the shop, drawing-room, and power plant.

### II (c). TWO-YEAR COURSE IN MECHANIC ARTS.

#### First Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Mechanical Drawing.....	3	3	3
Woodwork .....	2	2	2
Forge Work .....	2	2	..
Shop Lectures .....	2	..	2
Mechanical Technology.....	..	2	2
Physics.....	2	2	2
Algebra.....	5	5	..
Plane Geometry.....	..	..	5
English.....	3	3	3
Military Drill.....	3	3	2
Totals.....	22	22	21

## Second Year.

Mechanical Drawing.....	3	3	3
Machine-shop Work.....	3	3	3
Power Machinery.....	3	3	3
Algebra.....	5	2	..
Geometry.....	..	3	5
English.....	3	3	3
Drill.....	3	3	3
Elective work:			
Machine Shop or Drawing.....	2	2	2
Pattern Work.....	..	2	2
Foundry.....	2	..	..
Totals.....	24	24	24

## SUBJECTS OF INSTRUCTION.

## First Year.

**Mechanical Drawing.**—Instruction in care and use of instruments; lettering, geometrical drawing; projection drawing; isometric and cabinet projections; drawing from working sketches of machine details; tracing; blueprinting; elements of Descriptive Geometry; cylinders; cones; prisms; intersections and developments; miscellaneous problems. Three periods. Mr. COBURN.

**Note.**—Each student will be required to furnish at his own expense, the following outfit. To insure uniformity in grade of instruments and other supplies, the department keeps for sale, at practically cost, the articles named below. These may be purchased elsewhere, but must be approved by the department. Estimated cost of outfit, \$12 to \$15.

Text-book.

Drawing board 21 x 30 inches.

T-square 30 inches.

60° triangle 9 inches, transparent.

45° triangle 7 inches, transparent.

12-inch triangular architect's scale.

Irregular curve.

4 H Pencil. H or F pencil.

Erasers for ink and pencil.

Penholder with fine points.

Pencil sharpener.



Instrument set consisting of:

6-inch compass with pen, pencil, and lengthening bar.

5½-inch dividers with hairspring adjustment.

3-inch bow dividers, 3-inch bow pencil, 3-inch bow pen.

5½-inch ruling pen, 4½-inch ruling pen.

**Woodwork.**—The use and care of the ordinary woodworking bench tools. Exercises in laying out and working from drawings; sawing, planing, and making of joints. The use and care of woodworking machines, such as saws, planers, shapers, dovetailers, tenoners, etc. Exercises in wood-trimming. Work on repairs about the College. Two periods. Mr. WHEELER.

**Forge Work.**—Treatment of iron and steel, the uses of the fuller, swage, punch and set hammer; drawing and upsetting; butt, scarf, and jump welding; making of forge and machine shop tools, with tempering of tool steel; exercises on power hammer. Special work on equipment and repairs about the College. Two periods, first and second terms. Mr. NICHOLS. Mr. HURT.

**Foundry.**—Recitations and exercises in foundry work, including working condition of the sand, use and care of tools, moulding, core-making, management of cupola and crucible furnaces in iron and brass melting. Elective for second year. Two periods, first term. Mr. NICHOLS, Mr. HURT.

**Mechanical Technology.**—Classification and uses of woodworking and forging tools and machines. Methods of woodworking and forging. Arrangement, sizes, and care of belting and shafting; elementary power problems, steel-making, etc. Two periods. Professor SATTERFIELD.

**Algebra.**—Wells' *New Higher Algebra*. A thorough treatment of the fundamental conceptions and operations of Elementary Algebra, embracing the subjects of factoring, fractions, simple and simultaneous equations, involution, evolution, theory of exponents, and radicals. Five periods, first and second terms. Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

**Plane Geometry.**—Wentworth's *Plane and Solid Geometry*. Three books of Plane Geometry, including numerous original exercises. Five periods, third term. Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

**Short Course English.**—This is a thoroughly practical course in the elements of grammar and of composition, especially spelling, sentence and paragraph structure, and letter-writing. Some reading is done in class, and supplementary reading is assigned for private study. Three hours a week. Required of first-year students. Doctor SUMMEY, Mr. PRATT.

**Physics.**—Properties of matter, fundamental units, British and metric standard measures, mechanics, liquids, gases, heat, introduction to light and sound. Two periods. Assistant Professor McINTYRE, Mr. SOUTH.

**Shop Lectures.**—A series of lectures and recitations on the construction and use of woodworking tools and machinery; on the lumbering industry and preparation of lumber; on foundry and forge practice; on pattern-making; on shop equipment in general labor-saving devices, etc., etc. Professor SATTERFIELD and Assistants.

#### Second Year.

**Machine Drawing.**—Sketching and drawing of machine parts and machines. Detail working drawings. Tracing and blueprinting. Two periods. Prerequisite, first year, Mechanical Drawing. Assistant Professor ELLIS.

**Machine-shop Work.**—Bench and machine work. Exercises in chipping and filing. Exercises in lathe work, boring, reaming, drilling, planing, milling, and shaper-work. Two periods. Mr. PARK.

**Power Machinery.**—Descriptive study of the machinery of steam power plants, engines, boilers, condensers, pumps, steam turbines, piping, care and management, study of gas and oil engines. Combustion of fuels. Indicators; indicated, brake, and boiler horse-power problems. Three periods. Mr. MORRIS.

**Pattern-making.**—A study of pattern-making in its relation to moulding; the practical construction of patterns to prevent warping and twisting; making of special patterns, cores, and core-boxes, introducing draft, shrinkage, finish, and the appliances and usages of modern pattern work. Prerequisite, Woodwork. Elective for second year. Two periods, second and third terms. Mr. WHEELER.

**Algebra.**—Wells' *New Higher Algebra*. Begin with quadratic equations and complete summation of series, embracing ratio and proportion, variation, the progressions, the binomial theorem, undetermined coefficients, logarithms, compound interest and annuities, permutations, combinations, and continued fractions. Five periods, first term. Prerequisite: First-year Algebra. Professor YATES, Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

**Plane and Solid Geometry.**—This course begins with the fourth book, completes *Solid Geometry*, and includes numerous original exercises. Five periods, second and third terms. Required of Freshmen. Prerequisites: First-year Geometry and a term standing of 60 per cent or more on the work of the first term. Professor YATES, Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

**Composition and Rhetoric.**—After a review of grammatical principles, especial attention is given to the selection of subjects and the planning of essays, to the choice of words, and to the structure of sentences and paragraphs. Standard poetry and prose are read in class, and additional books are assigned for parallel reading. Frequent short themes are written. Three periods. Required of second-year students. PROFESSOR HARRISON, DOCTOR SUMMEY, MR. PRATT.

## FOUR-YEAR COURSE IN ELECTRICAL ENGINEERING.

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The four-year course in Electrical Engineering is planned for those who wish a thorough practical preparation for following this profession. Only the most thorough training in the fundamental laws and principles of electricity and magnetism will suffice as a preparation for this branch of engineering in which the art is advancing so rapidly. This training is given by a careful study of text-books and coördinated work in the various laboratories. The department, as will be seen from the equipment described below, is well supplied with dynamos, motors, transformers, and other electrical machines, and with testing instruments and apparatus of all descriptions.

### ELECTRICAL ENGINEERING EQUIPMENT.

The course in Electrical Engineering is accompanied by work in the laboratory and the designing-room. The department occupies the western portions of the basement and of the first floor of Winston Hall. On the first floor are the classrooms, offices, library, drafting-room, and instrument laboratory. The classrooms are well equipped for demonstrating the principles studied in the text-books. The designing-room is suitably furnished for its purpose and the instrument laboratory is supplied with standardizing apparatus and instruments, provided for quickly determining the accuracy of all the apparatus used in actual measurements and also for advanced measurements in electricity and magnetism. This room is well supplied with power, current from single-, two- or three-phase sources being available, as well as direct current from the power-house or storage batteries.

In the basement are located the dynamo laboratory, the photometric laboratory, instrument room, the department's repair shop, and rooms for high-tension apparatus, storage battery, and stores.

The dynamo laboratory is a room 90 x 30 feet. Its equipment consists of direct and alternating current dynamos and motors of practically all types and ranging in size from one to thirty-seven kilowatts, the aggregate capacity being about two hundred kilowatts in machines and seventy-five kilowatts in transformers. Power is supplied to the laboratory by means of three independent circuits running from the College power-house. A full complement of ammeters, voltmeters, wattmeters, phasemeters, tachometers, rheostats, condensers, inductances, and other apparatus used in the study of electrical machines is provided. The equipment is arranged so that power

is conveniently supplied to a number of independent stations, at each of which a group of students can conduct an experiment without being affected by the work of other groups.

#### POWER-HOUSE.

The College power-house is also available for student instruction. It is a brick building containing an excellent equipment of modern type. This consists of one seventy-five kilowatt, six-hundred volt, three-phase, revolving field alternator directly connected to a high-speed engine; two fifty-kilowatt, three-hundred volt, three-phase revolving field alternators, driven by a DeLaval steam turbine, with direct-driven exciter; a ten-kilowatt, direct-connected, direct current generator, a motor-generator exciter set; and a completely equipped switchboard.

The city of Raleigh is unusually well situated for students of Electrical Engineering. The local power company has a fine modernized steam turbine-driven plant which operates in conjunction with the water-power plant at Buckhorn Falls, on the Cape Fear River, from which point the power is transmitted at sixty thousand volts. This company also owns the large plant at Blewetts Falls, from which power is transmitted at one hundred and ten thousand volts. This line crosses the College property, and has an open-air transformer and meter station located within easy reach.

#### LIBRARY.

This department has a small but growing library and takes a number of the leading electrical journals, all of which are at all times available for the students' use.

#### PHYSICS.

A thorough training in the elements of Physics is necessary as a preparation for entering any engineering profession. The course in Physics is planned with this specific object in view. Instruction in the classroom is accompanied by laboratory courses laid out so as to illustrate the principles taught in the former, and also so as to train the student to observe accurately and to give him considerable facility in the manipulation of scientific instruments. During the first year the subject is presented in an elementary manner. In the second year a more thorough study of general physics is made.

Brief courses in Physics are given for students in Agriculture and Textile Industry and an elementary course is given to students in the short courses in Mechanic and Textile Arts, and Agriculture.

**Equipment.**

The laboratories and classrooms for the work in Physics are in the basement of Holladay Hall, practically the whole floor being given up to this department. There are two large, well-equipped classrooms with facilities for giving experimental lectures; and there are two large, well-lighted laboratories, one for the first-year course in Physics and the other for advanced physical measurements. Special attention has been paid to the equipment of these laboratories, the object being to enable the student to determine from his actual experience the truth of the principles which he learns in the classroom.

II (d). The Four-year Course in Electrical Engineering, leading to the degree of Bachelor of Engineering.

**Freshman Year.**

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Elementary Physics, 280.....	4	4	4
Physical Laboratory, 282.....	1	1	1
Mechanical Drawing, 230.....	2	2	2
Woodwork, 235.....	2	2	2
Forge Work, 236.....	..	2	2
Shop Lectures, 253.....	2	..	..
Algebra, 340.....	5	3	..
Geometry, 341.....	..	2	5
Composition and Rhetoric, 360.....	3	..	..
American Literature, 361.....	..	3	3
Military Drill, 390.....	3	3	2
Totals.....	22	22	21

## Sophomore Year.

Physics, 281.....	2	2	2
Physical Laboratory, 283.....	1	1	1
Descriptive Geometry, 231.....	2	--	--
Mechanical Drawing, 232.....	--	2	2
Geometry, 342.....	5	--	--
Advanced Algebra, 343.....	--	3	--
Trigonometry, 344.....	--	2	5
Inorganic Chemistry, 300.....	3	3	3
Inorganic Chemical Laboratory, 301.....	2	2	2
Foundry, 237.....	2	--	--
Pattern-making, 238.....	--	2	2
Advanced Rhetoric, 362.....	3	3	--
Public Speaking, 363.....	--	--	3
Military Tactics, 391.....	1	1	1
Military Drill, 390.....	3	3	2
Totals.....	24	24	24

## Junior Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Electrical Engineering, 284.....	3	3	3
Electrical Engineering Laboratory, 289.....	2	2	2
Steam Engines and Boilers, 241.....	2	2	2
Machine-shop Work, 239.....	1	1	1
Machine Design, 233.....	2	2	2
Mechanics, 250.....	2	2	2
Analytical Geometry, 345.....	5	2	--
Calculus, 346.....	--	3	5
English Literature, 364.....	3	3	3
Military Drill, 390.....	3	3	2
Totals.....	23	23	22

## Senior Year.

Alternating Currents, 236.....	3	3	3
Electrical Applications, 257.....	2	2	2
Electrical Transmission, 288.....	--	2	2
Electrical Engineering Laboratory, 291.....	2	2	2
Electrical Design, 292.....	2	2	2
Applied Mechanics, 251.....	3	--	--
Mechanics of Materials, 252.....	--	2	2
Steam Engineering Laboratory, 249.....	1	1	1
Calculus, 346.....	3	--	--
Hydraulics, 215.....	--	2	2
Journals, 365.....	2	--	--
Classics, 366.....	--	2	2
Economics, 367.....	1	1	1
Elect one subject from the following:			
Military Drill, 390.....	3	3	2
Modern Languages, 370, 371, 372.....	3	3	3
Totals.....	22	22	22

## Subjects of Instruction.

280. **Physics.**—Properties of matter; fundamental units; English and metric standard measures; definitions of force, work, power; laws of motion; principles of machines; mechanics and fluids; heat; sound; light; electricity and magnetism. Text-book, Milliken and Gales' *A First Course in Physics*. Four periods. Required of Freshmen in Engineering and Chemistry. Assistant Professor LATANÉ, Mr. PRITCHETT.

281. **Physics.**—A more advanced course in Physics, particular attention being given to mechanics, fluids, and gases, heat, and electricity and magnetism. Text-book, Kimball's *College Physics*. Two periods. Required of Sophomores in Engineering and Chemistry. Assistant Professor LATANÉ, Mr. PRITCHETT.

282. **Physical Laboratory.**—Practice in handling units in British and metric systems; composition and resolution of forces; the lever; the inclined plane; the pendulum; density; specific gravity; thermometer calibration; calorimetry; expansion of materials; wave lengths; laws of strings; laws of lenses and mirrors; reflection; magnetism; electrostatics; the electric circuit. One period. Required



of Freshmen in Engineering and Chemistry. Assistant Professor LATANÉ, MR. PRITCHETT, MR. SOUTH.

**283. Physical Laboratory.**—A more advanced course in physical measurements accompanying the classroom instruction in this subject. More care, greater accuracy, and more elaborate reports are required in this course than in the Freshman laboratory. Work is designed not only to impress the truths and principles taught in the classroom, but to give some facility in the use of scientific instruments. One period. Required of Sophomores in Mechanical and Electrical Engineering and Chemistry. Assistant Professor LATANÉ, MR. PRITCHETT, MR. SOUTH.

**284. Direct Current Machinery and Apparatus.**—A thorough study is made of the production and utilization of direct currents, beginning with the theory of the magnetic circuit, electromagnetic induction, electrical measurements, storage batteries, dynamos and motors, operation and care of direct current machinery, electrical distribution, and lighting. Text-book, Franklin & Esty's *Elements of Electrical Engineering*. Three periods, through the year. Required of Juniors in Electrical Engineering. Prerequisites, Subjects 281, 342, 343, and 344. Professor BROWNE.

**285. Electrical Engineering.**—An introductory course for students in other engineering departments, consisting of the study of the apparatus used in the production, distribution, and utilization of electrical power. Required of Juniors in Mechanical Engineering. Text-book, Timbie's *Elements of Electricity*. Two periods. Prerequisites, Subjects 281, 342, 343, and 344. Professor BROWNE.

**286. Alternating Currents and Machinery.**—A study of the flow of periodic currents in circuits containing resistance, inductance, and capacity. The construction, operation, and performance of alternating current machinery. Text-book, Franklin & Esty's *Alternating Currents*. Three periods. Required of Seniors in Electrical Engineering. Prerequisites, Subjects 284, 345, 346. Professor BROWNE.

**287. Industrial Applications of Electricity.**—A detailed study is made of the many industrial applications of electricity, including the various methods of distributing electrical energy, illumination, electric traction, the electric drive in mill and factory, electric power stations, industrial electro-chemistry and electro-metallurgy, telegraphy, and telephony. Two periods. Required of Seniors in Electrical Engineering. Prerequisites, Subjects 284 and 289. Professor BROWNE, Assistant Professor MCINTYRE.

**288. Electrical Transmission of Power.**—A practical study of the problems involved in the transmission of power from the generating station to the consumer. Hydro-electric developments. High-tension

transmission. Required of Seniors in Electrical Engineering. Text-book, Ferguson's *The Elements of Electrical Transmission*. Two periods throughout the second and third terms. Prerequisites, Subjects 284, 280. Professor BROWNE.

**289. Direct Current Laboratory.**—This study accompanies that of direct current machinery. It includes use of standardizing apparatus, calibration of instruments, advanced electric and magnetic measurements, and the operation and testing of direct-current dynamos and motors. Text-book, Sever & Townsend's *Laboratory and Factory Tests*, supplemented by notes. Two periods. Required of Juniors in Electrical Engineering. Prerequisites, Subjects 281 and 283. Assistant Professor McINTYRE, Mr. PRITCHETT.

**290. Electrical Engineering Laboratory.**—This course accompanies Study 285. Instruction is given in the care and operation of direct and alternating current machinery. Required of Juniors in Mechanical Engineering. One period. Text-book, Sever's *Direct Current Tests*. Prerequisites, Subjects 281, 283. Assistant Professor McINTYRE.

**291. Advanced Dynamo Laboratory.**—This study is taken up simultaneously with the study of alternating currents. It includes practice with alternating currents, measurements of inductance and capacity, experimental study of transformers, alternating current generators and motors, advanced methods of testing electrical apparatus, and shop testing. Text-book, Sever & Townsend's *Laboratory and Factory Tests*, supplemented by notes. Two periods. Required of Seniors in Electrical Engineering. Prerequisites, Subjects 284 and 289. Assistant Professor McINTYRE.

**292. Electrical Design.**—An introductory course in the designing of electrical apparatus, taking up the design of rheostats and heating devices, controllers, and electromagnets, the design of transformers, direct and alternating current dynamos and motors. Two periods. Required of Seniors in Electrical Engineering. Prerequisite, Subject 284. Professor BROWNE.

## COURSE IN CHEMISTRY.

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In harmony with the general purposes for which the College was founded, the course in Chemistry is arranged to prepare young men for careers in that department. To this end the training given in general, organic, and analytical chemistry is supplemented by instruction in technical chemical analysis and in applied chemical subjects. The kindred scientific subjects of Biology and Physics are taught, together with the cultural studies included in the other courses.

The chemical laboratories of the North Carolina Department of Agriculture and of the North Carolina Agricultural Experiment Station afford the student an opportunity to keep in touch with the methods of research in this department of agricultural science.

The State Museum is open to the public each day, and among other things contains a very excellent collection of the State's minerals, ores, and building stones.

There are in the city of Raleigh and its vicinity several manufacturing plants to which, through the courtesy of the owners, the students in chemistry, in company with the teaching staff of this department, make visits each year. These include plants for the manufacture of illuminating gas, sulphuric acid, fertilizers, and ice; for the extraction of cotton-seed oil, and for the dyeing of cotton goods.

### CHEMICAL EQUIPMENT.

The Chemical Department occupies the whole of the second floor of Winston Hall. There are two classrooms for about thirty students each and one classroom for ninety students. The classrooms are well lighted, have very convenient lecture tables and settees with arm-rests for taking notes.

The laboratory for inorganic chemistry can accommodate three hundred and thirty-six students, the laboratory for analytical chemistry ninety-six students, and for organic chemistry twenty students. A small laboratory has been set aside for special work. The laboratories are fitted up with conveniently arranged desks and hoods, each of which has the necessary water and gas connections. The balance room is located between the analytical and organic laboratories.

The department also has a dark room for photographic work, fire-proof rooms for combustion, ample stockrooms and a preparation room.

The Chemical library, containing an excellent collection of reference books and complete sets of the leading chemical journals, occupies a room convenient to the laboratories for the upper classmen.

The members of the instructing staff have offices adjacent to the laboratories.

41(e). The Four-year Course in Chemistry, leading to the degree of Bachelor of Science.

Freshman Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Inorganic Chemistry, 300.....	2	2	2
Inorganic Chemistry (laboratory), 301.....	1	1	1
Physics, 280.....	4	4	4
Physical Laboratory, 282.....	1	1	1
Botany, Elementary, 320.....	3	3	..
Botany, Systematic, 321.....	..	..	3
Algebra, 340.....	5	3	..
Geometry, 341.....	..	2	5
Composition and Rhetoric, 360.....	3	..	..
American Literature, 361.....	..	3	3
Military Drill, 390.....	3	3	2
Totals.....	22	22	21

Sophomore Year.

Analytical Chemistry, Qualitative, 304.....	3	3	3
Physics, 281.....	2	2	2
Physical Laboratory, 283.....	1	1	1
Physiology, 328.....	2	..	..
Drawing, 230.....	..	2	2
Geometry, 342.....	5	..	..
Advanced Algebra, 343.....	..	3	..
Trigonometry, 344.....	..	2	5
German, 370.....	3	3	3
Advanced Rhetoric, 362.....	3	3	..
Public Speaking, 363.....	..	..	3
Military Tactics, 391.....	1	1	1
Military Drill, 390.....	3	3	2
Totals.....	23	23	22

## Junior Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Organic Chemistry, 303.....	2	2	2
Organic Chemistry (laboratory), 306.....	3	3	3
Analytical Chemistry, Quantitative, 305.....	4	4	4
Bacteriology, 322.....	2	2	2
Soils, 331.....	3	3	3
German, 370.....	3	3	3
English Literature, 364.....	3	3	3
Military Drill, 390.....	3	3	2
Totals.....	23	23	22

## Senior Year.

Inorganic Chemistry, 307.....	2	2	2
Organic Chemistry, 303.....	3	--	--
Organic Chemistry (laboratory), 306.....	2	--	--
Analytical Chemistry, Quantitative, 305.....	6	8	8
Biochemistry, 308.....	--	3	3
Journals, 365.....	2	--	--
Classics, 366.....	--	2	2
Elect seven periods from the following:			
Economics, 367.....	1	1	1
Military Drill, 390.....	3	3	2
Advanced Bacteriology, 323.....	3	3	3
Soils, Advanced, 332.....	3	--	--
Feeds, 335.....	--	3	--
Fertilizers, 333.....	--	--	3
Drawing, 230.....	2	2	2
Analytical Geometry, 345.....	5	2	--
Calculus, 346.....	--	3	5
Other subjects if approved by the Professor of Chemistry.			
Totals.....	22	22	22

## SUBJECTS OF INSTRUCTION.

**300. Inorganic Chemistry.**—Newell's *Inorganic Chemistry*. The common elements and their principal compounds are studied, together with some of the fundamental principles of the science. The lectures are illustrated by experiments and the exhibition of specimens. Three periods. Required of Sophomores in Engineering. Two periods. Required of Freshmen in Chemistry. Professor WITHERS, Doctor WILLIAMS, Mr. PATE, Doctor NOWELL.

**301. Inorganic Chemistry.**—Laboratory work. Newell's *Inorganic Chemistry*. The student performs under the eye of the instructor experiments designed to illustrate and emphasize the work of the classroom. Two periods. Required of Sophomores in Engineering. One period. Required of Freshmen in Chemistry. Doctor NOWELL, Mr. SHERWOOD.

**302. Organic Chemistry.**—Remsen's *Organic Chemistry*. The fundamental principles of organic chemistry and the more important compounds are studied. Laboratory work accompanies the lectures and recitations. Two periods. Required of Juniors in Chemistry. Doctor NOWELL.

**303. Organic Chemistry.**—A continuation of 302. Three periods, first term. Required of Seniors in Chemistry. Professor WITHERS.

**304. Analytical Chemistry.**—Segerblom's *Qualitative Analysis*. A discussion of the principles involved in chemical analysis, together with laboratory work. The student is taught to detect the presence of the common elements in unknown substances. Three periods. Required of Sophomores in Chemistry. Mr. PATE.

**305. Analytical Chemistry.**—Treadwell's *Quantitative Analysis*. Gravimetric and volumetric analysis, special attention being given to the analysis of substances of agricultural and technical importance. Four periods. Required of Juniors in Chemistry. Six periods. Required of Seniors in Chemistry. Doctor WILLIAMS.

**306. Organic Chemistry.**—Laboratory work. Orndorff's *Laboratory Manual*. The typical transformation and syntheses of the aliphatic and aromatic groups are taken up. The student thus becomes familiar with the reactions and properties of the more important organic compounds. Three periods. Required of Juniors in Chemistry. Doctor NOWELL. Two periods, first term. Required of Seniors in Chemistry. Doctor WILLIAMS.

**307. Advanced Inorganic Chemistry.**—Lectures and recitations. Two periods. Required of Seniors in Chemistry. Doctor WILLIAMS.

**308. Biochemistry.**—Three periods, second and third terms. Required of Seniors in Chemistry. Professor WITHERS.

## BOTANY AND BACTERIOLOGY.

**320. Elementary Botany.**—Recitation, laboratory work and reference reading regarding the algæ, fungi, ferns, and seed plants. Morphology is emphasized, and the broad principles of nutrition, reproduction, growth, sex, adaptation, and evolution are illustrated. Particular consideration is given to the fungi. The student's knowledge is made his own through laboratory work and simple independent investigations. Three periods, first, second, and third terms. Required of Freshmen in Chemistry. Professor FULTON, Mr. ROSENKRANS.

**321. Bacteriology.**—Lectures and laboratory work on the physiology, morphology, and economy of bacteria, with especial reference to home sanitation and disinfection, and to the relation of bacteria to disease in plants and animals and to agricultural practice. The student becomes familiar in the laboratory with methods of culture and investigation in bacteriology. Two periods. Required of Juniors in Chemistry. Mr. NORTON.

**322. Bacteriology (Advanced).**—A course designed to extend knowledge in special fields and to perfect the technique in bacteriology for those who desire to do original work in bacteriology. Work may be elected in sewage bacteriology, dairy bacteriology, bacterial plant diseases, bacteriology of manure, water, soil or air. The course is flexible and will be made to fit the requirements of those students electing it. Three periods. Elective for Seniors in Chemistry. Prerequisites, Botany 321. Professor FULTON, Mr. NORTON.

## SOILS.

**331. Soils.**—Attention is given to the forces that decompose and disintegrate rock and to the influence of these forces and of the various kinds of rock on the resulting soil. The physical characters, such as water-holding capacity, capillarity, drainage, effect of mulches, temperature and weight, and the modification of these characters by tillage, cropping, and all operations of practical soil management, are discussed and exemplified in the classroom, laboratory, and field. Some attention is given to the classification of soils in the United States and especially in North Carolina. The physical, chemical, and bacteriological soil conditions are discussed in relation to each other and to their effects on soil fertility. Systems of maintaining the permanent productiveness of soils are studied. Three periods throughout the year. Required of Juniors. Prerequisite, Chemistry 300, 301, and Physics 280. Professor SHERWIN.

**332. Advanced Soils.**—In this course the student will be guided in the study of any line of Soils work he may choose, either along practical or scientific lines. Laboratory work will be given. Considerable reference will be made to Experiment Station literature with the aim of acquainting the student with the literature on the subject and with the methods of investigation used. Three periods, first term. Prerequisite, Soils 331. Elective for Seniors in Chemistry. Professor SHERWIN.

**333. Fertilizers.**—Fertilizing as a factor in soil management and economical crop production. Sources, composition, availability and value of various commercial and farm fertilizers. Comparative value of the elements of plant food in different carriers as shown by their productive capacity. Fertilization of all the principal crops of the State and of any special crops in which the class is interested will be discussed, considering amount, method, and time of application as well as the most economical formula to use. Two periods, third term. Elective for Seniors in Chemistry. Prerequisite, Soils, 331. Professor SHERWIN.

#### STOCK FEEDING.

**335. Stock Feeding.**—A study of the compositions of feeds, and the food requirements of the domestic animals. The student will be required to become familiar with the fundamental principles, so that he can compound suitable rations for the different classes of live stock. Special emphasis will be laid upon practical problems in feeding. Three periods a week, second term. Elective for Seniors in Chemistry. Professor McNUTT.

#### MATHEMATICS.

While the subject of mathematics is presented in such a manner that the student obtains a thorough working knowledge of those principles which he needs in his Engineering Course, yet it is not the purpose to subordinate the general theory of Mathematics to the practical side. The work consists of recitations, written exercises, and lectures, with frequent oral and written quizzes.

**340. Algebra.**—Wells' *New Higher Algebra*. Begin with quadratic equations and complete summation of series, embracing ratio and proportion, variation, the progression, the binomial theorem, undetermined coefficients, logarithms, compound interest and annuities, permutations, combinations, and continued fractions. Five periods, first term. Required of Freshmen. Prerequisite, entrance requirements. Professor YATES, Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.



**341. Plane and Solid Geometry.**—This course begins with the fourth book, completes *Solid Geometry*, and includes numerous original exercises. Five periods, second and third terms. Required of Freshmen. Prerequisites, entrance requirements and a term standing of 60 per cent or more on the work of the first term. Professor YATES, Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

**342. Solid Geometry.**—A thorough course in Solid Geometry, with more than two hundred original exercises. Also, the application of Plane Geometry to conic sections. Required of Sophomores. Five periods, first term. Prerequisites, first term Freshman mathematics and 341. Professor YATES, Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

**343. Advanced Algebra.**—Wells' *New Higher Algebra*. The general theory of equations, the solution of higher equations, determinants, etc. Required of Sophomores. Three periods, second term. Prerequisite, 340 and 341. Professor YATES, Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

**344. Trigonometry.**—Wells' *Plane and Spherical Trigonometry*. Plane Trigonometry. Definitions of the trigonometric functions; derivation of formulæ, with their application. Solution of plane triangles, etc. Spherical Trigonometry. Solution of spherical triangles. This course includes the solution of many practical problems. Required of Sophomores. Two periods, second term; five periods, third term. Prerequisite, 340 and 341. Professor YATES, Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

**345. Analytical Geometry.**—Nichols' *Analytical Geometry*. Loci of equations, straight line, circle, parabola, ellipse, hyperbola, a discussion of the general equation of the second degree, higher plane curves, and geometry of three dimensions. Five periods, first term; two periods, second term. Required of Juniors in Engineering. Prerequisite, 342, 343, and 344. Professor YATES, Mr. PITTS.

**346. Differential and Integral Calculus.**—Osborne's *Elements of Calculus*. A thorough treatment of the fundamental principles and derivations of formulæ; applications to various problems, such as expansion into series, evaluation of indeterminate forms, maxima and minima, radius of curvature, lengths of curves, areas, volumes, etc. Three periods, second term; five periods, third term. Required of Juniors in Engineering. Three periods, first term. Required of Seniors in Engineering. Prerequisite: For differential calculus, 342, 343, and 344; for integral calculus, differential calculus and 345. Professor YATES, Mr. PITTS.

## ENGLISH.

**360. Composition and Rhetoric.**—After a review of the principles of English grammar, special attention is given to the selection of subjects, the planning of essays, and to the study of words, sentences, and paragraphs. Frequent themes are required, the work being directed mainly upon the mechanics of writing and the making of reports on scientific studies. Required of Freshmen. Three periods, first term. DR. SUMMEY, MR. PRATT.

**361. American Literature.**—The study of the history of American literature is accompanied with the reading and analysis in class of the writings of representative American authors. Essays are based largely upon class and parallel reading. Three periods, second and third terms. Required of Freshmen. DR. SUMMEY, MR. PRATT.

**362. Advanced Rhetoric.**—The principles of style and the forms of discourse constitute the basis of the work. Scientific exposition in particular is studied in selected essays and addresses; and in frequent essays the principles learned are put into practice. Three periods, first and second terms. Required of Sophomores. PROFESSOR HARRISON, DR. SUMMEY, MR. PRATT.

**363. Public Speaking.**—The principles governing the preparation and the delivery of public addresses are given in text-book and in lectures. The reading in class of addresses in various styles, the writing of several papers by each member of the class, and practice in delivery, complete the work. Three periods, third term. Required of Sophomores. PROFESSOR HARRISON, DR. SUMMEY, MR. PRATT.

**364. English Literature.**—The inductive study of the development of English poetry and prose is pursued in the works of standard writers of the different periods. The continuity is emphasized by a text-book on the history of the literature. Occasional essays and parallel reading form an important part of the work. The purpose of the course is to cultivate in the student a taste for the best writings of the greatest writers. Three periods, three terms. Required of Juniors. PROFESSOR HARRISON.

**365. Journals.**—To give practical knowledge of technical and of other standard journals is the purpose of this course. The frequent essays required are mainly of scientific and technical character. Two periods, first term. Open to Seniors. PROFESSOR HARRISON.

**366. Classics.**—The lives and works of the greatest scientists, and of other great writers, particularly of the nineteenth century, are studied in this course. Essays will be continued as in the first term. Two periods, second and third terms. Open to Seniors. PROFESSOR HARRISON.

**367. Economics.**—An introductory study of the general principles of economics is followed by a special consideration of business organization, labor problems, money and banking, and the relation of government to industry. Special attention is devoted to rural economics. One period, three terms. Open to Seniors. Professor HARRISON, Doctor SUMMEY.

#### MODERN LANGUAGES.

The aim of the department is to enable one (*a*) to use a limited vocabulary for practical purposes in speaking and writing fluently simple sentences without idiomatic expressions or difficult constructions, and (*b*) to read scientific works and to know the meaning of difficult constructions and idiomatic expressions of the foreign language.

A unilingual method is used, based on conversation, humorous anecdotes, interesting short stories, and scientific articles. The student is taught to think in the foreign language by a direct association of thoughts with foreign expressions without the medium of English.

The meaning and fluent use of foreign expressions are taught by a direct appeal to real objects, gestures, pictorial illustrations, cognates, context, comparisons, contrasts, and associations, beginning with leading simple questions and gradually progressing to more advanced ones, by frequent repetitions, and by a strict adherence to the rule that answers be always given in complete short sentences of the foreign language and never by "yes," "no," or some other short word alone.

Grammatical and lexical details for the thorough understanding of the lesson are given. The rules are deduced from the examples, and the student is trained in their correct use by interesting connected matter.

Written examinations consist of translations from English into the foreign language and of questions and answers in the foreign language. No English appears in an examination paper. No time is allowed for hesitancy. Answers are spoken fluently and written rapidly.

Instruction is given three hours per week. The work is optional, but credit towards a degree is allowed for the successful completion of the work.

The languages regularly taught are German for students of Chemistry and Mechanical Engineering, and Spanish for Civil and Electrical Engineering students.

A complete set of Holzel's Wall Pictures in colors is used. The pictures represent life of man in the home, the city, during the spring,

the summer, fall, and winter, and they furnish most interesting topics for conversation.

**370. German.**—Worman's *Modern Languages*, first and second German books; *Studien und Plaudereien*, first and second books; Fischer's *Practical Lessons in German*; *Practical German Grammar*, by Calvin Thomas; *German Reader*, by Fischer; and a scientific reader. Three periods. Elective for Juniors or Seniors. Doctor RUDY.

**371. French.**—Worman's *Modern Languages*, First and Second French books; Worman's *Grammaire Française*; selected short stories from French literature, and scientific readers. This subject may be taken by special petition to the Faculty. Doctor RUDY.

**372. Spanish.**—Worman's *Modern Languages*, First and Second Spanish books; *Introduccion a la Lengua Castellana*, by Marion y Des Garrenes; a Spanish grammar to be selected; Fontaine's *Flores de Espana*, and other short stories of Spanish literature; *Modelos para Cartas*. Elective for Juniors and Seniors in Civil and Electrical Engineering. Doctor RUDY.

#### MILITARY SCIENCE.

**150. Drill.**—Callisthenic exercises; bayonet exercises; military signaling; school of the soldier, squad, company, and battalion; ceremonies including inspection, parade, review, and guard mounting; guard duty; marches and minor tactics; attack and defense; gallery and range target practice. Three hours each week for the first and second terms; two hours each week for the third term. Required of all classes except Seniors. Seniors may take either the drill or three extra hours in some other subject instead. Captain PEACE and Cadet Officers of the Battalion.

**151. Tactics.**—Theoretical instructions in infantry drill regulations, field-service regulations, manual for guard duty, and small-arms firing manual. One hour each week. Required of Sophomores. Captain PEACE.

### III. TEXTILE COURSES.

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#### III (a). The Four-year Course in Textile Industry.

##### THE TEXTILE DEPARTMENT.

The Textile Department, which is a fully equipped Textile School, contains all the necessary machinery for instruction in manufacturing cotton yarns and fabrics from the bale to the finished product. The student is taught the theory of cotton spinning, weaving, designing, and dyeing. In connection with the theory, he learns the practical operation of cotton machinery used in carrying on the different processes. Further, he learns such essential practical details as enable him to adjust and fix the machinery so as to produce the proper results. As a result of this training, each student produces for himself cotton yarns of different numbers, and cotton fabrics of different kinds, from his own designs and choice of colors.

##### TEXTILE INSTRUCTION.

In this department two courses of instruction are offered, the four-year course, leading to the degree of Bachelor of Engineering, and the two-year course in carding and spinning, weaving, designing, and dyeing.

##### Four-year Course.

The four-year course offers complete facilities for full instruction in all branches of cotton-mill work. Practical training in textile work begins in the Freshman year and forms a part of the work in each of the following years. The combination of practical with theoretical training is begun in the Sophomore year and continues in the Junior and Senior years. The theoretical work is directly related to the practical work going on, and this combination offers the best means for studying cotton-mill work and its operations.

##### Two-year Course.

The two-year course is offered to students who cannot spend the time required for the four-year course, or who have had practical experience in the mill and wish to avail themselves of our facilities for giving special instruction in textile work.

**TEXTILE BUILDING AND EQUIPMENT.**

The textile building is located on the west campus. It is a two-story brick building one hundred and twenty-five by seventy-five feet, with a basement. Throughout, its construction is similar to that of a cotton mill, being an illustration of standard construction in this class of buildings. The basement is fitted up with a laboratory and classroom for instruction in dyeing and with dyeing machinery. On the first floor are located the hand and power looms and the necessary warp-preparation machinery. The carding and spinning machinery is located on the second floor. Electricity is used as a motive power, the machinery of each department in the building being driven by a separate motor. The machinery equipment consists of the latest types of cotton-mill machinery manufactured by American builders.

**Power and Power Transmission.**

One 30-horse power 3-phase 550-volt motor, made by General Electric Company, for driving carding and spinning machinery.

One 15-horse-power 3-phase 550-volt motor, made by General Electric Company, for driving weaving machinery.

One 10-horse-power 3-phase 550-volt motor, made by Fairbanks-Morse Company, for driving dyeing machinery.

Pulleys, shaftings, hangers, and couplings, made by Jones & Laughlin Company, Ltd., Pittsburg, Pa.

Belting, made by Fayerweather & Ladew, New York City, and Maloney-Bennett Belting Company, Chicago, Ill.

**Carding Department.**

**Opening Room.**—One cotton gin, made by Continental Gin Company, Birmingham, Ala. One thread extractor, made by Kitson Machine Company, Lowell, Mass. One combination opener and breaker lapper, made by Kitson Machine Company, Lowell, Mass. One 40-inch single beater finisher lapper, with patent carding beater, made by Kitson Machine Company, Lowell, Mass.

**Carding Room.**—One 40-inch revolving flat card, 112 flats, with collier, made by Mason Machine Works, Taunton, Mass. One 40-inch revolving flat card, 110 flats, with collier, made by Whitin Machine Works, Whitinsville, Mass. One 40-inch revolving flat card, 110 flats, with collier, made by Saco & Pettee Machine Shops, Newton Upper Falls, Mass. One single railway head, with collier, leather rolls, made by Whitin Machine Works, Whitinsville, Mass. One drawing frame, four deliveries, leather rolls, made by Whitin Machine Works, Whitinsville, Mass. One railway head, with collier, metallic rolls, and im-

proved evener motion, made by Saco & Pettee Machine Shops, Newton Upper Falls, Mass. One drawing frame, four deliveries, metallic rolls, made by Saco & Pettee Machine Shops, Newton Upper Falls, Mass. One sliver lap machine, one ribbon lap machine, and one six-head combing machine, made by Whitin Machine Works, Whitinsville, Mass. One 36-spindle slubber for 11 x 5½-inch bobbin, with ball-bearing top rolls, made by Woonsocket Machine and Press Company, Woonsocket, R. I. One 48-spindle intermediate roving frame for 9 x 4½-inch bobbin, made by Saco & Pettee Machine Shops, Biddeford, Me. One 64-spindle fine roving frame for 7 x 3½-inch bobbin, with ball-bearing top rolls, made by Woonsocket Machine and Press Company, Woonsocket, R. I. One 80-spindle jack roving frame for 6 x 2½-inch bobbin, with ball-bearing top rolls, made by Woonsocket Machine and Press Company, Woonsocket, R. I.

#### Spinning Department.

**Spinning Room.**—One 64-spindle spinning frame for warp; one 80-spindle spinning frame for filling, made by Whitin Machine Works, Whitinsville, Mass. One 80-spindle spinning frame for warp, one 80-spindle spinning frame for filling, made by Mason Machine Works, Taunton, Mass. One 80-spindle spinning frame for warp, one 80-spindle spinning frame for filling, made by Fales & Jenks Machine Company, Pawtucket, R. I. One 64-spindle spinning frame for warp, one 64-spindle spinning frame for filling, made by Saco & Pettee Machine Shops, Biddeford, Me. One 48-spindle spinning frame, combination build, made by D. A. Tompkins Company, Charlotte, N. C. One 240-spindle mule spinning frame, 1½-inch gauge, made by Asa Lees & Co., Oldham, England.

**Spooling, Twisting, and Winding.**—One 40-spindle spooler, made by Draper Company, Hopedale, Mass. One 40-spindle spooler, made by Whitin Machine Works, Whitinsville, Mass. One 32-spindle spooler, made by Easton & Burnham, Pawtucket, R. I. One 40-spindle spooler, made by D. A. Tompkins Company, Charlotte, N. C. One 48-spindle twister, made by Whitin Machine Works, Whitinsville, Mass. One 100-spindle wet twister, made by Draper Company, Hopedale, Mass. One 48-spindle twister, one-half for wet, one-half for dry twisting, made by Fales & Jenks Machine Company, Pawtucket, R. I. One 50-spindle reel, one-half live, one-half dead spindles, made by D. A. Tompkins Company, Charlotte, N. C. One 40-spindle reel, made by Draper Company, Hopedale, Mass. One 6-spindle universal winding machine, made by Universal Winding Company, Boston, Mass. One section warper, 400 ends, made by Draper Company, Hopedale, Mass.

**Weaving Department.**

**Warp Preparation.**—One 12-spindle bobbin-winding machine, made by Jacob K. Altemus, Philadelphia, Pa. One 4-spindle bobbin winding machine, made by Universal Winding Company, Boston, Mass. One beaming machine, made by Lewiston Machine Company, Lewiston, Me. One beaming machine, complete, made by the T. C. Entwistle Company, Lowell, Mass.

**Looms.**—One Northrop-Draper print-cloth loom; two Northrop-Draper sateen looms; one Northrop-Draper loom with 20-harness dobby, made by Draper Company, Hopedale, Mass. Three high-speed sheeting looms, made by Kilburn, Lincoln & Co., Fall River, Mass. One sheeting loom, one 12-harness dobby loom, one 24-harness dobby loom, one 4 x 1 gingham loom, made by Whitin Machine Works, Whitinsville, Mass. One print-cloth loom, one 2 x 1 box loom, one 24-harness dobby loom, made by Mason Machine Works, Taunton, Mass. One 4-harness twill loom, made by Lowell Machine Shop, Lowell, Mass. One Crompton 4 x 1 box gingham loom, one Crompton 4 x 1 box loom with 20-harness dobby; one Crompton 2 x 1 box loom with 400-hook Jacquard machine; one Knowles Gem loom with 4 x 4 box; one Stafford single-box loom with 20-harness dobby, made by Crompton & Knowles Loom Works, Worcester, Mass. One single-box loom with 200-hook table-napkin Jacquard machine; one 4 x 1 box table-cover loom with 624-hook Halton Jacquard machine, made by Crompton-Thayer Loom Company, Worcester, Mass. One Whitin loom with 624-hook Halton Jacquard for crochet quilts; one 5-cylinder, 200-hook Jacquard, made by Schaum & Uhlinger, Philadelphia; ten 4 x 4 box hand looms with 30-harness witchheads for narrow fabrics; two 4 x 4 box hand looms with 400-hook and 600-hook Jacquard machines, from Thomas Halton's Sons, Philadelphia.

**Knitting.**—One full automatic knitting machine, made by George D. Mayo Machine Company, Laconia, N. H. One combination ribber and footer, one ribber made by Scott & Williams, Philadelphia. One "Banner" knitting machine, made by Hemphill Manufacturing Company, Pawtucket, R. I. One ribber, made by Wildman Manufacturing Company, Norristown, Pa. One looper, made by Beattie Manufacturing Company, Cohoes, N. Y. One looper, made by Grosser Machine Company, New York.

**Dyeing Department.**

The Dyeing Department is located in the basement of the Textile Building, and consists of an experimental dyeing laboratory with desk



room sufficient for thirty students, a lecture-room, a stock-room, an office, and a room seventy by fifty feet which is fitted up to give instruction in practical dye-house work.

The dyeing laboratory is well fitted up with appropriate work tables and all the necessary apparatus for experimental dyeing, dye-testing, color-matching, and the testing of dyed samples to light, acids, alkalis, etc., as well as for carrying out the various chemical operations necessary in dyeing. The dye-house is equipped with the proper dyeing machinery needed in the dyeing of large quantities of material, and the giving of practical instruction in boiling out, bleaching, and dyeing of raw stock, cops, skeins, warps, and piece goods.

The department has a large collection of dye-stuffs and color cards. Through the kindness of the various dyestuff dealers and manufacturers the department is regularly supplied with all new dyestuffs and color cards as soon as they are put on the market, thus affording the student ample opportunity to become familiar with the latest methods and products for commercial work. The department is indebted to the following firms for donations of dyestuffs and chemicals:

Farbwerke-Hoechst Company, New York.  
Badische Company, New York.  
Farbenfabriken of Elberfeld Company, New York.  
American Dyewood Company, New York.  
Berlin Aniline Works, New York.  
Cassella & Co., New York.  
Kallé & Co., New York.  
Geisenheimer & Co., New York.

**Dye-house Equipment.**—Seven dye vats; one Roessler & Hasslacher bleaching vat; one Jefferson high-pressure boiling-out kier; one hand-dyeing jigger; one 10-gallon steam-jacketed copper kettle; one steam aging box; one Fairmount warp dyeing machine; one Textile Finishing Company's warp dyeing machine; one Textile Finishing Company's warp sizing machine; one 5-can upright dryer; one small Light-foot raw stock dyeing machine; one Tolhurst Machine Works hydro-extractor; one Schaum & Uhlinger hydro-extractor; one Mather & Platt cloth printing machine; one Fries warp dyeing machine.

A full equipment of analytical balances and other necessary apparatus for experimental work is provided.

III (a). The Four-year Course in Textile Industry, leading to the degree of Bachelor of Engineering.

Freshman Year.

SUBJECTS.	PERIODS A WEEK.*		
	1st Term.	2d Term.	3d Term.
Carding and Spinning, 400†.....	1	1	1
Weaving, 401.....	2	2	2
Mechanical Drawing, 430.....	2	2	2
Shop Lectures, 431.....	2	--	--
Woodwork, 432.....	2	2	2
Forge Work, 433.....	--	2	2
Algebra, 441.....	5	3	--
Geometry, 442.....	--	2	5
Elementary Physics, 440.....	2	2	2
Composition and Rhetoric, 450.....	3	--	--
American Literature, 451.....	--	3	3
Military Drill, 480.....	3	3	2
Totals.....	22	22	21

Sophomore Year.

Carding and Spinning, 400.....	2	2	2
Weaving, 401.....	2	2	2
Textile Designing, 402.....	2	1	1
Cloth Analysis, 403.....	--	1	1
Inorganic Chemistry, 420.....	3	3	3
Inorganic Chemistry (laboratory), 421.....	2	2	2
Drawing.....	--	2	2
Trigonometry, 445.....	5	--	--
Advanced Rhetoric, 452.....	3	3	--
Public Speaking, 453.....	--	--	3
Military Drill, 480.....	3	3	2
Military Tactics, 481.....	1	1	1
Totals.....	23	23	22

\*The lecture and recitation periods are one hour; the laboratory, shop, and other practice periods, two hours.

†The figures immediately following the name of the study are given to aid one in finding readily a description of the subject. Under each department a number precedes the description of the study.

## Junior Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Carding and Spinning, 400 .....	4	4	4
Weaving, 401 .....	3	3	3
Textile Designing, 402 .....	3	2	2
Cloth Analysis, 403 .....	..	1	1
Dyeing, 410 .....	2	2	2
Dyeing (laboratory), 411 .....	3	3	3
Steam Engines and Boilers, 435 .....	2	2	2
English Literature, 454 .....	3	3	3
Military Drill, 460 .....	3	3	2
Totals .....	23	23	22

## Senior Year.

Carding and Spinning, 400 .....	4	4	4
Weaving, 401 .....	4	4	4
Textile Designing, 402 .....	3	3	3
Cloth Analysis, 403 .....	1	1	1
Dyeing, 410 .....	1	1	1
Dyeing (laboratory), 411 .....	3	3	3
Mill Accounting and Mill Costs, 404 .....	1	1	1
Machine-shop Work, 434 .....	2	2	2
Elect three periods from the following:			
Journals, 455 .....	2	..	..
Classics, 456 .....	..	2	2
Economics, 457 .....	1	1	1
Military Drill, 480 .....	3	3	2
Modern Languages, 460, 461 .....	3	3	3
Totals .....	22	22	22

## SUBJECTS OF INSTRUCTION.

**400. Carding and Spinning.**—Lectures and recitations; practice in operating card and spinning room machinery. Cotton: classifying the plant, its growth, varieties, ginning, baling and marketing the raw staple. Cotton at the mill; selecting and mixing. Openers and lap-pers; cards; sliver lap machines; ribbon lap machines; combers, railway-heads; drawing-frames; slubbers; intermediate; speeders; jacks. Ring spinning-frames and mules. Spoolers. Twisters; reels; cone-winders. Construction and functions of each machine; making the various calculations. Drafts, speed of parts, production. Producing yarns of different counts, single and ply. Testing yarns for breaking strength and elasticity. Text-books: *Cotton Mill Processes and Calculations*, by Tompkins; *Cotton Spinning*, by Nasmith. Required of Freshmen, Sophomores, Juniors, and Seniors. Assistant Professor PARKER.

**401. Weaving.**—Lectures and practice in warp preparation, operating and fixing looms, cloth-finishing machinery. Warp preparation: pin frame warper; section warper; beam warper; construction of beam warper, stop motion, measuring motion, creel; pattern warp making; long and short chain beamers. Slashing: steam cylinder slasher; hot-air slasher; construction of slasher, creel, cylinder, immersion roll, squeeze rolls, drying fan, separator rolls, winding yarn on beam, cone drive, slow motion, measuring and cut marking motion. Sizing: construction of size kettle; size mixing and boiling; division of sizing ingredients; value of ingredients; sizing recipes for light, medium, and heavy sizing. Loom-mounting: reeds and harnesses; drawing in, and putting warps in loom. Looms: hand looms and power looms, construction of plain loom, principal movements in weaving, let-off and take-up motions, filling stop motion, warp stop motion. Cams and their construction. Magazine looms, construction and advantages. Drop box looms: chain building for box looms, changing boxes to have easy-running looms, construction and value of multipliers, timing and fixing box motions. Pick and pick-looms. Box-chain and multiplier-chain building, arrangement of colors in boxes to give easy-running loom. Ball and shoe-pick motion. Construction and fixing of head motion. Dobby, single and double index; construction and fixing of dobbie; extra appliances necessary for weaving leno, towel, and other pile fabrics. Value of easers; half motion; and jumper attachment for leno. Springs and spring-boxes. Pattern chain building. Jacquard: single and double lift; construction and tie-up. Weave-room calculations, speed and production cal-

culations, relative speed of looms, counts of cotton harness. Finishing: inspection of cloth; singeing and brushing; calendering, tentering; folding and packing for the market. Equipment necessary for warp preparation, weaving, finishing; approximate cost of production of fabrics in the different processes. Text-book: *Weaving, Plain and Fancy*, by Nelson. Required of Freshmen, Sophomores, Juniors, and Seniors in the Four-year Course and of first and second year students in the Short Course. Professor NELSON, Mr. STEED.

**402. Textile Designing.**—Lectures and practice in designing. Method of representing weaves on design paper. Foundation weaves: Plain, twill, satin. Ornamentation of plain weave; color effects on plain weave. Derivative weaves, plain and fancy basket weaves, warp and filling rib weaves. Broken twills, curved twills, corkscrew twills, entwining twills. Granite weaves, satin shading. Combination of weaves; figured weaving on plain ground. Satin and figured stripes on plain ground. Spots arranged in different orders on plain, twill, satin ground. Imitation leno, honeycomb weaves. Bedford cords and combination with other weaves. Wave designs, pointed twills, diamond effects. Plain and fancy piqués. Double plain, figured double plain. Double cloths. Cloths backed with warp; cloths backed with filling. Cloths ornamented with extra warp; cloths ornamented with extra filling. Cotton velvet. Corduroy. Matelasse. Leno weaves with one, two, and more sets of doups. Principles of working both top and bottom doups. Combination of plain and fancy weaves with leno. Methods of obtaining leno patterns. Jacquards. Distribution and setting out of figures for geometrical and floral effects. Distributing figures to prevent lines. Areas of patterns. Preparation of sketches. Transfer of sketches to design paper. Painting in the design with different weaves according to sketch. Shading of patterns. Card cutting and lacing. Required of Sophomores, Juniors, and Seniors. Professor NELSON, Mr. STEED.

**403. Cloth Analysis and Fabric Structure.**—Calculating particulars of cloth from data ascertained from samples. Shrinkages. Dents in patterns; patterns in warp. Drafting and pattern chain building. Reed and harness calculations. Calculations to obtain quantities of warp and filling in stripe and check fabrics. To find number of threads per inch, using a given weight of warp; also number of picks per inch, using a given weight of filling. Yarn calculations. System of numbering woolen, worsted, silk, linen, and cotton yarns. Determination of one system of yarn to that of another. Textile calculations. Determining the number of threads and picks per inch to make a perfect cloth. Calculations to determine the texture in an

unequally reeded fabric. Diameter of threads. Balance of cloth. Texture for double cloth. Required of Sophomores, Juniors, Seniors. Professor NELSON, Mr. STEED.

**404. Mill Accounting and Cost Finding.**—The general fundamental principles of the various systems of cost-finding as applicable to the different classes of manufactured products are carefully explained, as well as questions of commissions, discounts, depreciation, inventories, distribution of expenses, etc. As a clear understanding of accounting is necessary for intelligent cost-finding, the method of keeping accounts is studied in detail. The general idea is to impress on the student the relative cost of production for any class of manufactured product and to show how the different processes of manufacturing influence cost. One period, first, second, and third terms. Required of Seniors. Mr. HALSTEAD.

#### DYEING COURSE.

This course is especially for those who wish to engage in any branch of Textile Chemistry, Dyeing, Bleaching, Finishing, or in the manufacture or sale of dyestuffs and chemicals used in the textile industry, and is designed to give a scientific technical education to those who desire to embrace these branches of industrial technology.

Dyeing as an art has long been practiced, but with the introduction of scientific methods it is rapidly developing and assuming a position in the front rank of applied sciences.

As the textile industries of the State increase, the need of young men who have been trained in the principles as well as the practice of the different factory operations becomes apparent. In the course in dyeing the student is taught the different practical methods of the dye-house; the chemistry of the dyestuffs, some of each class of which he actually makes; the chemical changes brought about by mordants, assistants, etc. He also learns color matching, dye testing, and the methods for the analysis of the different chemicals used in the dye-house. He carries on the study of carding, spinning, weaving, designing, cloth analysis, etc., to the end of the Sophomore year, with the other textile students, and with them devotes attention to shop-work, drawing, engines, boilers, etc., together with the general studies of English, History, Mathematics, Physics, and General Chemistry, which are required in all the Four-year Courses.

III (b). The Four-year Course in Dyeing, leading to the degree of Bachelor of Science.

Freshman Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Carding and Spinning, 400.....	1	1	1
Weaving, 401.....	2	2	2
Mechanical Drawing, 430.....	2	2	2
Shop Lectures, 431.....	2	--	--
Woodwork, 432.....	2	2	2
Forge Work, 433.....	--	2	2
Algebra, 441.....	5	3	--
Geometry, 442.....	--	2	5
Elementary Physics, 440.....	2	2	2
Composition and Rhetoric, 450.....	3	3	3
American Literature, 451.....	--	3	3
Military Drill, 480.....	3	3	2
Totals.....	22	22	21

Sophomore Year.

Carding and Spinning, 400.....	2	2	2
Weaving, 401.....	2	2	2
Textile Designing, 402.....	2	1	1
Cloth Analysis, 403.....	--	1	1
Inorganic Chemistry, 420.....	3	3	3
Inorganic Chemistry (laboratory), 421.....	2	2	2
Geometry, 443.....	5	--	--
Advanced Algebra, 444.....	--	3	--
Trigonometry, 445.....	--	2	5
Advanced Rhetoric, 452.....	3	3	--
Public Speaking, 453.....	--	--	3
Military Drill, 480.....	3	3	2
Military Tactics, 481.....	1	1	1
Totals.....	23	23	22

## Junior Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Dyeing, 410.....	2	2	2
Dyeing (laboratory), 411.....	5	3	3
Organic Chemistry, 422.....	2	2	2
Analytical Chemistry, 424, 425.....	5	7	7
English Literature, 454.....	3	3	3
Military Drill, 480.....	3	3	2
German, 460.....	3	3	3
Totals.....	23	23	22

## Senior Year.

Dyeing, 410.....	3	3	3
Dyeing (laboratory), 411.....	2	2	2
Organic Chemistry, 423.....	2	2	2
Analytical Chemistry, 425.....	6	6	6
Organic Chemistry (laboratory), 426.....	3	3	3
Elect six periods from the following:			
Journals, 455.....	2	--	--
Classics, 456.....	--	2	2
Economics, 457.....	1	1	1
Military Drill, 480.....	3	3	2
German, 460.....	3	3	3
Totals.....	22	22	22

## SUBJECTS OF INSTRUCTION.

410. **Dyeing.**—With the microscope and other testing apparatus the student makes a careful study of the various fibers used in the textile industry. He also studies the chemical and physical properties of these fibers, and the action of acids, alkalis, heat, moisture, and the various other agencies to which fibers are liable to be subjected. He next takes up the study of the fundamental principles which underlie the arts of bleaching and dyeing, such as the boiling out and bleaching of cotton, and the chemical reactions involving each step; the adapta-



bility of water for bleaching and dyeing, followed by the theories of dyeing; substantive dyestuffs and their application to cotton; after-treatment of direct dyestuffs, including diazotising and developing and the topping with basic dyestuffs; the application to cotton of basic dyestuffs, acid dyestuffs, mordant dyestuffs, including a study of the various mordants and their fixation with metallic salts; dyeing with sulphur dyestuffs, indanthrenes, indigo, natural and artificial, aniline black, turkey red, and the insoluble azo colors developed on the fiber; the methods of bleaching and dyeing of linen, jute, ramie, and other vegetable fibers; the scouring and bleaching of wool; the carbonization and chlorination of wool; the application of basic, acid, chrome, eosin, and direct colors to wool; dyeing wool with logwood, fustic, and other natural dyewoods; methods of the making and dyeing of artificial silk; the boiling off, bleaching and dyeing of natural silk; study of the chemical and physical changes which take place during mercerization; also the methods of dyeing mercerized goods; the use of the various kinds of machines used in bleaching and dyeing; the dyeing of raw-stock, skeins, cops, warps, piece goods, hosiery, underwear, and unions; the science of color-mixing; color-matching on textiles; the use of the tintometer and colorimeter; calico printing, including the various methods of preparing the various pastes, thickening agents, mordants and assistants used in printing; quantitative analysis of mixed yarns, and fabrics composed of cotton, wool, and silk; the testing of dyestuffs for their shade, tinctorial power, and leveling properties; comparative dye trials to determine money value; testing for mixtures; the reactions of acids, alkalis, and reducing agents on several samples taken from the different classes of dyestuffs.

The course of lectures, as outlined above, will include the consideration of many difficult problems that arise in the dye-house, with especial reference to the dyeing, mercerizing, and finishing of cotton yarns and pieces. Required of Juniors and Seniors in Textile Industry. **Mr. HALSTEAD.**

**411. Dyeing Laboratory.**—A series of experiments is performed which covers all the subjects taken up in the lecture course, and includes a large amount of work done in the laboratory and dye-house. Special stress is put on the matching of colors and the dyeing of sulphur and indanthrene dyestuffs. Each student is required to bleach and dye a large number of samples of yarn and cloth on a small scale, and is required to mount specimens of his work in a pattern book. At the discretion of the instructor in charge, the class bleaches and dyes larger quantities of raw-stock, cloth, and yarn in the dye-house, as well as prints samples on the laboratory printing

machine. This work will be supplemented by visits to the mills which do dyeing in the city of Raleigh. Required of Juniors and Seniors in Textile Industry. Mr. HALSTEAD.

#### CHEMISTRY.\*

420. **Inorganic Chemistry.**—Newell's *Inorganic Chemistry*. The common elements and their principal compounds are studied, together with some of the fundamental principles of the science. The lectures are illustrated by experiments and the exhibition of specimens. Three periods. Required of Sophomores. Professor WITHERS, Doctor WILLIAMS, Mr. PATE, Doctor NOWELL.

421. **Inorganic Chemistry.**—Laboratory work. Newell's *Inorganic Chemistry*. The student performs under the eye of the instructor experiments designed to illustrate and emphasize the work of the classroom. The latter part of the year is devoted to an introductory course in qualitative analysis. Two periods. Required of Sophomores. Doctor NOWELL, Mr. SHERWOOD.

422. **Organic Chemistry.**—Remsen's *Introduction to the Study of the Compounds of Carbon*. The fundamental principles of organic chemistry and the more important compounds are studied through the aliphatic series. Two periods. Required of Juniors in Dyeing. Doctor NOWELL.

423. **Organic Chemistry.**—A continuation of 422, beginning with the aromatic series. Two periods. Required of Seniors in Dyeing. Professor WITHERS.

424. **Analytical Chemistry.**—W. A. Noyes' *Qualitative Analysis*. A discussion of the principles involved in chemical analysis, together with laboratory work. The student is taught to detect the presence of the common metallic elements, as well as that of the acids, in unknown substances. Four periods, first term. Required of Juniors in Dyeing. Doctor WILLIAMS.\*

425. **Analytical Chemistry.**—Treadwell's *Quantitative Analysis*. Gravimetric and volumetric analysis, special attention being given to the analysis of substances of technical importance. Seven periods, second and third terms. Required of Juniors in Dyeing. Six periods. Required of Seniors in Dyeing. Doctor WILLIAMS.\*

426. **Organic Chemistry.**—Laboratory work. Orndorff's *Laboratory Manual*. The typical transformations and syntheses of the aliphatic and aromatic groups are taken up. The student thus becomes familiar with the reactions and properties of the more important organic compounds. One of each of the more important classes of dyestuffs is prepared and the properties studied. Three periods. Required of Seniors in Dyeing. Doctor NOWELL.

\*For further information see course in Chemistry.

## MECHANICAL ENGINEERING.\*

**430. Mechanical Drawing.**—Work in the use of the pencil; technical sketches of objects, usually parts of a machine. Geometric drawing; isometric and cabinet drawing; elementary projections; drawings made to scale from working sketches of pieces of a machine; elementary principles of descriptive geometry; cylinders, cones, and prisms; intersection and development of surfaces; miscellaneous problems. Two periods. Required of Freshmen. Mr. COBURN.

**431. Shop Lectures.**—A series of lectures and recitations on the construction and use of woodworking tools and machinery; on the lumbering industry and preparation of lumber; on foundry and forge practice; on pattern-making; on shop equipment in general, labor-saving devices, etc. Two periods, first term. Professor SATTERFIELD and assistants.

**432. Woodwork.**—Use of bench tools; working from drawings, lining, sawing, planing; practice in making simple exercises in wood-turning. Two periods. Required of Freshmen. Mr. CLAY.

**433. Forge Work.**—Exercises in working with iron, welding; use and care of forge tools and fires. Two periods, second and third terms. Required of Freshmen. Mr. HURTT, Mr. NICHOLS.

**434. Machine-shop Work.**—Bench and machine work. Exercises in chipping and filing. Exercises in lathe work, boring, reaming, drilling, planing, milling, and shaper work. Two periods. Required of Textile Seniors. Mr. PARK.

**435. Steam Engines and Boilers.**—A study of the structural details of modern steam engines; the slide valve, both in its simple form and when used in combination with independent cut-off valves; link motion and other reversing gears; and the Zeuner diagram. Attention is given to the effect of the reciprocating parts and to inertia and tangential pressures; the class also studies the steam-engine indicator, indicator rigging, and steam distribution as disclosed by the indicator.

The various forms of steam boilers are studied, and the methods employed in their construction are noted. The following subjects are studied in detail: number and size of tubes and flues, the thickness of plates, strength of different styles of riveting, kinds of bracing, amount of grate and heating surface, different kinds of steam and water gauges, safety valves and injectors; the causes and methods of preventing foaming, incrustation, and corrosion; the manner of setting boilers, and of operating them with safety and economy; feed-water heaters; mechanical stokers; smoke-consumers and chimneys. Two periods. Required of Juniors in Textile Industry. Mr. VAUGHAN.

\*For further information see course in Mechanical Engineering.

## PHYSICS.\*

440. **Elementary Physics.**—In this course special stress is laid upon the subjects of mechanics, liquids, gases, and heat. It includes the study of the fundamental units, British and metric standard measures, definitions of force, work and power, laws of motion, principles of machines, mechanics of fluids, gases, and heat, and brief introductions to the study of sound and light. Two periods. Required of Freshmen. Mr. SOUTH.

## MATHEMATICS.

441. **Algebra.**—Wells' *New Higher Algebra*. Begin with quadratic equations and complete summation of series, embracing ratio and proportion, variation, the progressions, the binomial theorem, undetermined coefficients, logarithms, compound interest and annuities, permutation, combinations and continued fractions. At the beginning of the term a review is usually given on involution, evolution, theory of exponents, and radicals. Five periods, first term; three periods, second term. Required of Freshmen. Prerequisite: For first term, entrance requirements; for second term, the work of the first term, or, in case of failure, a term standing of 60 per cent or more, and a final examination grade of at least 40 per cent, on the work of the first term. Professor YATES, Mr. PITTS, Mr. HARRELSON, Mr. TUCKER.

442. **Plane Geometry.**—Wentworth's *Plane and Solid Geometry*. A complete course in Plane Geometry, including numerous original exercises. Two periods, second term; five periods, third term. Required of Freshmen. Prerequisite, entrance requirements. Mr. PITTS, Mr. HARRELSON, Mr. TUCKER.

445. **Trigonometry.**—Wells' *Plane and Spherical Trigonometry*. Plane Trigonometry. Definitions of the trigonometric functions; derivation of formulæ, with their application. Solution of plane triangles, etc. Spherical Trigonometry. Solution of spherical triangles. This course includes the solution of many practical problems. Required of Sophomores. Two periods, second term; five periods, third term. Prerequisite, 441 and 442. Professor YATES, Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

## ENGLISH.

450. **Composition and Rhetoric.**—After a review of the principles of English grammar, special attention is given to the selection of subjects, the planning of essays, and to the study of words, sentences, and paragraphs. Frequent themes are required, the work being

\*For further information see course in Electrical Engineering.

directed mainly upon the mechanics of writing and the making of reports on scientific studies. Required of Freshmen. Three periods, first term. Doctor SUMMEY, Mr. PRATT.

451. **American Literature.**—The study of the history of American literature is accompanied with the reading and analysis in class of the writings of representative American authors. Essays are based largely upon class and parallel reading. Three periods, second and third terms. Required of Freshmen. Doctor SUMMEY, Mr. PRATT.

452. **Advanced Rhetoric.**—The principles of style and the forms of discourse constitute the basis of the work. Scientific exposition in particular is studied in selected essays and addresses; and in frequent essays the principles learned are put into practice. Three periods, first and second terms. Required of Sophomores. Professor HARRISON, Doctor SUMMEY, Mr. PRATT.

453. **Public Speaking.**—The principle governing the preparation and the delivery of public addresses are given in text-book and in lectures. The reading in class of addresses in various styles, the writing of several papers by each member of the class, and practice in delivery, complete the work. Three periods, third term. Required of Sophomores. Professor HARRISON, Doctor SUMMEY, Mr. PRATT.

454. **English Literature.**—The inductive study of the development of English poetry and prose is pursued in the works of standard writers of the different periods. The continuity is emphasized by a text-book on the history of the literature. Occasional essays and parallel reading form an important part of the work. The purpose of the course is to cultivate in the student a taste for the best writings of the greatest writers. Three periods, three terms. Required of Juniors. Professor HARRISON.

455. **Journals.**—To give practical knowledge of technical and of other standard journals is the purpose of this course. The frequent essays required are mainly of scientific and technical character. Two periods, first term. Open to Seniors. Professor HARRISON.

456. **Classics.**—The lives and works of the great scientists, and of other great writers, particularly of the nineteenth century, are studied in this course. Essays will be continued as in the first term. Two periods, second and third terms. Open to Seniors. Professor HARRISON.

457. **Economics.**—An introductory study of the general principles of economics is followed by a special consideration of business organization, labor problems, money and banking, and the relation of government to industry. Special attention is devoted to rural economics. One period, three terms. Open to Seniors. Professor HARRISON, Doctor SUMMEY.

## MODERN LANGUAGES.

The aim of the department is to enable one to use a limited vocabulary for practical purposes in speaking and writing fluently simple sentences without idiomatic expressions or difficult construction, and to read scientific works, and to know the meaning of difficult constructions and idiomatic expressions of the foreign language.

A unilingual method is used, based on conversation, humorous anecdotes, interesting short stories and scientific articles. The student is taught to think in the foreign language by a direct association of thoughts with foreign expressions without the medium of English. The meaning and fluent use of foreign expressions are taught by a direct appeal to real objects, gestures, pictorial illustrations, cognates, context, comparisons, contrasts, and associations, beginning with leading simple questions, and gradually progressing to more advanced ones, by frequent repetitions, and by a strict adherence to the rule that answers be always given in complete short sentences of the foreign language, and never by "yes," "no," or some other short word alone.

Grammatical and lexical details for the thorough understanding of the lessons are given. The rules are deduced from the examples, and the student is trained in their correct use by interesting connected matter.

Written examinations consist of translations from English into the foreign language and of questions and answers in the foreign language. No English appears in an examination paper. No time is allowed for hesitancy. Answers are spoken fluently and written rapidly.

Instruction is given three hours per week.

Students may elect German during the Junior or Senior year. The work is optional, but credit towards a degree is allowed for the successful completion of the work. Work begun and continued a month may not be dropped without consent of the Faculty.

The languages taught are German and French.

**460. German.**—Worman's *Modern Languages*, first and second German books; *Studien und Plaudereien*, first and second books; Fischer's *Practical Lessons in German*; *Practical German Grammar*, by Calvin Thomas; *German Reader*, by Fischer; and a scientific reader. Elective for Juniors and Seniors. Doctor RUDY.

**461. French.**—Worman's *Modern Languages*, first and second French books; Worman's *Grammaire Française*; selected short stories from French literature, and scientific readers. Doctor RUDY.

This subject may be taken by special petition to the Faculty.

**MILITARY SCIENCE.**

**480. Drill.**—Callsthenic exercises; bayonet exercises; military signaling; school of the soldier, squad, company and battalion; ceremonies including inspection, parade, review and guard mounting; guard duty; marches and minor tactics; attack and defense; gallery and range target practice. Three hours each week for the first and second terms; two hours each week for the third term. Captain PEACE and Cadet Officers of the Battalion.

**Tactics.**—Theoretical instructions in infantry drill regulations, field-service regulations, manual for guard duty, and small-arms firing manual. One period each week. Required of Sophomores. Captain PEACE.

## TWO-YEAR COURSE IN TEXTILE INDUSTRY.

The two-year course is offered to students who cannot spend the time required for the four-year course, or who have had practical experience in the mill and wish to avail themselves of our facilities for giving instruction in textile work.

### III (c). The Two-year Course in Textile Industry.

#### First Year.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Carding and Spinning.....	2	2	2
Weaving.....	3	3	3
Textile Designing.....	2	1	1
Cloth Analysis.....	..	1	1
Mechanical Drawing.....	2	2	2
Forge Work.....	2	2	..
Foundry.....	..	..	2
Algebra.....	5	5	..
Plane Geometry.....	..	..	5
English.....	3	3	3
Military Drill.....	3	3	2
Totals.....	22	22	21

#### Second Year.

Carding and Spinning.....	5	5	5
Warp Preparation.....	..	..	1
Weaving.....	4	4	3
Textile Designing.....	2	1	1
Cloth Analysis.....	..	1	1
Dyeing.....	3	3	3
Machine-shop Work.....	2	2	2
English.....	3	3	3
Military Drill.....	3	3	2
Totals.....	22	22	21



## DESCRIPTION OF SUBJECTS.

**Carding and Spinning.**—Lectures and recitations; practice in operating card and spinning room machinery. Cotton: classifying the plant; its growth; varieties; ginning, baling, and marketing the raw stable. Cotton at the mill; selecting and mixing. Openers and lap-pers; cards; sliver lap machines; ribbon lap machines; combers; railway-heads; drawing-frames; slubbers; intermediate; speeders; jacks. Ring spinning-frames and mules. Spoolers. Twisters; reels; cone-winders. Construction and functions of each machine; making the various calculations. Drafts; speed of parts; production. Producing yarns of different counts, single and ply. Testing yarns for breaking strength and elasticity. Text-books: *Cotton Mill Processes and Calculations*, by Tompkins; *Cotton Spinning*, by Nasmith. Required of first- and second-year students. Assistant Professor PARKER.

**Weaving.**—Lectures on construction of plain, twill, sateen, ging-ham, pick and pick looms are given; also on construction of dobbles and jacquards.

Lectures begin with the construction of plain loom, first taking up the principal movements in weaving, then the various secondary or auxiliary movements, and the relation and timing of one movement to another. Additional motions and parts required to be added to a plain loom in order to weave twill and sateen cloths. Magazine looms; construction and advantages. Drop box looms; construction of the various motions; arranging colors in boxes; methods of building box chains. Dobby: construction of single and double index; setting, and starting up dobbie on loom; fixing dobbie. Pick and pick looms: construction of loom; construction of head motion; building box chains to have easy-running loom. Jacquard: single and double lift; construction and tie-up. Weave-room calculations for speed and production; counts of reed and cotton harness. Finishing cotton fabrics. Necessary equipment for warp preparation, weaving, finishing; approximate cost of production of fabrics in the different processes. Text-book: *Weaving, Plain and Fancy*, by Nelson. Required of first- and second-year students. Professor NELSON, Mr. STEED.

**Textile Designing.**—Lectures and practice in designing. Method of representing weaves on design paper. Foundation weaves; plain; twill; satin. Ornamentation of plain weave; color effects on plain weave. Derivative weaves; plain and fancy basket weaves; warp and filling rib weaves. Broken twills; curved twills; corkscrew twills; entwining twills. Granite weaves; satin shading. Combination of weaves; figured weaving on plain ground. Fancy satin and figured stripes on plain ground. Spots arranged in different orders

on plain, twill, satin ground. Imitation leno; honeycomb weaves. Bedford cords and combination with other weaves. Wave design; pointed twills; diamond effects. Cloths backed with warp; cloths backed with filling. Cloths ornamented with extra warp. Cloths ornamented with extra filling. Combination of plain and fancy weaves. Practical application of weaves to fabrics. Advanced designs. Required of first- and second-year students. Professor NELSON, Mr. STEED.

**Cloth Analysis and Fabric Structure.**—Calculating particulars of cloth from data ascertained from samples. Shrinkages. Dents in patterns; patterns in warp. Drafting and pattern chain building. Reed and harness calculations. Calculations to obtain quantities of warp and filling in stripe and check fabrics. To find number of threads per inch, using a given weight of warp; also number of picks per inch, using a given weight of filling. Yarn calculations. System of numbering woollen, worsted, silk, linen, and cotton yarns. Determination of one system of yarn to that of another. Textile calculations. Determining the number of threads and picks per inch to make a perfect cloth. Calculations to determine the texture in an unequally reeded fabric. Diameter of threads. Balance of cloth. Texture for double cloth. Required of first- and second-year students. Professor NELSON, Mr. STEED.

#### DRAWING AND SHOP WORK.

**Mechanical Drawing.**—Work in the use of the pencil; technical sketches of objects, usually parts of a machine. Geometric drawing; isometric and cabinet drawing; elementary projections; drawings made to scale from working sketches of pieces of a machine. Elementary principles of descriptive geometry; cylinders, cones, and prisms; intersection and development of surfaces; miscellaneous problems. Two periods. Required of first-year students. Mr. COBURN.

**Forge Work.**—Exercises in working with iron, welding; use and care of forge tools and fires. Two periods. Required of first-year students. Mr. WHEELER.

#### MATHEMATICS.

**Algebra.**—Wells' *New Higher Algebra*. A thorough treatment of the fundamental conceptions and operations of Elementary Algebra, with special attention to factoring, fractions, simple equations, simultaneous equations and problem solving, involution, evolution, theory of exponents, and radicals. Five periods, first and second terms. Required of first-year students. Mr. HARRELSON, Mr. PITTS, Mr. TUCKER.

**Plane Geometry.**—This course begins the subject and completes the first three books, special attention being given to original exercises. Five periods. third term. Mr. HARBELSON, Mr. PITTS, Mr. TUCKER.

**Drill.**—Calisthenic exercises; bayonet exercises; military signaling; school of the soldier; squad, company and battalion; ceremonies including inspection, parade, review and guard mounting; guard duty; marches and minor tactics; attack and defense; gallery and range target practice. Three hours each week for the first and second terms; two hours each week for the third term. Captain PEACE and Cadet Officers of the Battalion.

#### ENGLISH.

**Short Course English.**—This is a thoroughly practical course in the elements of grammar and of composition, especially spelling, sentence and paragraph structure, and letter-writing. Some reading is done in class, and supplementary reading is assigned for private study. Three hours a week. Required of first-year students. Doctor SUMMEY, Mr. PRATT.

#### ADDITIONAL SUBJECTS IN THE SECOND YEAR.

**Warp Preparation.**—Lectures on construction of warp preparation machinery, spooler; section warper, ball warper; size kettle; slasher. Practice in operating machines. Laying out pattern warps for long and short chain beaming. Size mixing and boiling; value of ingredients used in sizing; sizing receipts for light, medium, and heavy sizing. One period, third term. Required of second-year students.

**Dyeing.**—The object of this course is to give the student a sound practical knowledge of the fundamental principles which underlie the arts of bleaching, dyeing, mercerizing, etc., of cotton yarns and fabrics. The manipulation of the various machines used in bleaching, dyeing, and mercerizing is carefully explained. The physical and chemical properties of the material to be dyed receive first consideration, followed by a study of the adaptability of water for bleaching, dyeing, mordanting, etc. The practical application of the dyestuffs themselves is treated in the most thorough and detailed manner, *e. g.*, the substantive dyestuffs dyed direct, diazotised and developed, after-treated with metallic salts, topped with basic dyes, etc., the basic dyestuffs, sulphur dyestuffs, indanthrene dyestuffs, etc. Practice in color-mixing and matching is given. The student in this way acquires a collection of several hundred dyed samples which, when mounted in his pattern book, serve as a valuable reference. The course is sup-

plemented by lectures, which will include the consideration of many difficult problems that arise in the dye-house. Three periods. Required of second-year students. Mr. HALSTEAD.

**Machine-shop Work.**—Bench and machine work. Exercises in chipping and filing. Exercises in lathe work, boring, reaming, drilling, planing, milling, and shaper work. Two periods. Required of second-year students. Mr. PARK.

#### ENGLISH.

**Composition and Rhetoric.**—After a review of the principles of English grammar, special attention is given to the selection of subjects, the planning of essays, and to the study of words, sentences, and paragraphs. Frequent themes are required, the work being directed mainly upon the mechanics of writing and the making of reports on scientific studies. Required of second-year students. Three periods, first term. Doctor SUMMEY, Mr. PRATT.

**American Literature.**—The study of the history of American literature is accompanied with the reading and analysis in class of the writings of representative American authors. Essays are based largely upon class and parallel reading. Three periods, second and third terms. Required of second-year students. Doctor SUMMEY, Mr. PRATT.

## NORMAL COURSES.\*

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The Normal Courses are intended for the education of teachers, both men and women, chiefly along industrial lines. Industrial education, particularly in agriculture, is being introduced into our public schools, and there is a constant demand for teachers well trained in these subjects. It is hoped by means of the Normal Courses to help supply this demand. Our School Law already requires agriculture to be taught in the public schools, and manual work will doubtless be added. The courses are devoted largely to agriculture and nature study, and include also a review of other public-school studies.

Persons already engaged in teaching may, at slight expense of time and money, by means of the short course, or May School, make themselves proficient in one or more industrial lines. Persons preparing to teach may take the full courses, and thus become proficient, not only along industrial lines, but also in the other public-school branches and in one or more sciences, or in higher mathematics and English. The industrial training given is both practical and theoretical, and is arranged with reference to the present needs of the public schools in North Carolina. The Normal Courses are as follows:

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\*See also Normal Division of Agricultural Course, page 41.

## IV. Courses for Rural Teachers.

- (a) Two-year Course.  
 (b) One-year Course.  
 (c) Two-weeks Spring Course.

## First Year.

## IV. (a) TWO-YEAR COURSE.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Physics of Mathematics.....	5	5	5
Chemistry.....	3	3	3
English.....	3	3	3
Botany.....	3	3	3
Zoology.....	2	2	2
Agriculture.....	3	3	3
Plant Propagation.....	--	3	--
Vegetable Gardening.....	--	1	4
Physiology.....	2	--	--
Physiography.....	2	--	--
Totals.....	23	23	23

## Second Year.

Landscape Gardening.....	--	3	3
Practical Pomology.....	4	2	2
Soils.....	3	3	3
Poultry.....	--	3	3
Plant Diseases.....	2	2	2
Economic Entomology.....	2	2	2
Advanced Physiology.....	2	2	2
Breeds.....	--	3	3
Dairy.....	4	--	--
Drawing.....	2	--	--
Agriculture.....	3	3	3
Totals.....	22	23	21

## IV. (b) ONE-YEAR COURSE.

SUBJECTS.	PERIODS A WEEK.		
	1st Term.	2d Term.	3d Term.
Botany.....	3	3	3
Zoology.....	2	2	2
Agriculture.....	3	3	3
Plant Propagation.....	..	3	..
Vegetable Gardening.....	..	1	4
Physiology.....	2	..	..
Physiography.....	2	..	..
Soils.....	3	3	3
Poultry.....	..	3	3
Breeds.....	..	3	3
Dairy.....	4	..	..
Elective.....	2	2	2
Totals.....	21	23	23

## THE MAY SCHOOL FOR TEACHERS.

MAY 11 TO 23, 1914.

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**Agriculture, Nature Study, and Common Branches.**—This course is designed to meet the needs of teachers of the public, common, and high schools who desire more preparation in Nature Study and Agriculture. Attention is also given to school gardens. The common branches are reviewed. Attendance here meets the legal requirement of attendance at an institute once in each two years.

The laboratories, library, specimens, and all other equipment of the College are at the service of students of this course, affording an excellent opportunity for instruction.

The work is so arranged that teachers who desire to devote all of their time to Agriculture and Nature Study can do so, while those teachers who wish to devote part of their time to Agriculture and Nature Study and part to the common branches can pursue this course.

Instruction will be offered in the following subjects, from which election may be made to best meet particular needs:

Elementary Agriculture and Nature Study, Prof. H. R. FULTON.

School Management, Supt. Z. V. JUDD.

School Gardens, Supt. F. M. HARPER.

Farm Crops, Prof. C. L. NEWMAN.

Farm Animals, Prof. J. C. MCNUTT.

Horticulture, Prof. J. P. PILLSBURY.

Soils, Prof. M. E. SHERWIN.

Insects, Mr. Z. P. METCALF.

Poultry, Mr. T. H. TAYLOR.

Arithmetic, English, History, etc., are taught by the regular professors and instructors of the College.

No fees are charged for this course. Board may be had at \$2.75 a week, and lodging at about \$1 a week.

Only a limited number can be accommodated. Rooms must be engaged in advance.

For particulars and reservation, write to

**THE REGISTRAR,**  
A. and M. College, West Raleigh.



## RULES FOR ADVANCED DEGREES.

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Two degrees will be conferred: The Engineering Degree to non-resident graduates of the engineering courses and Master of Science to resident students pursuing graduate work.

### ENGINEERING DEGREES.

1. The degree of Civil Engineer, Mechanical Engineer, or Electrical Engineer may be conferred upon graduates of the several engineering departments of the College not sooner than three years after graduation.

2. Each candidate for an engineering degree must file his application for enrollment not later than October 5th.

3. He must file with his application a statement of the work he has done since graduation and the title of the thesis which he will present.

4. The record of the work and the subject of the thesis must be approved by the Faculty's standing committee on graduate students before the applicant will be enrolled as a candidate for a degree.

5. The completed thesis must be submitted not later than May 1st in approved form. Reports, designs, or drawings, made in the regular course of his employment will not be accepted.

6. A candidate must submit with his thesis tangible records of the work he has done and upon which his application for the degree is based, such records to consist of complete drawings, detailed drawings, photographs, records of tests, or other such matter as will show the character of the work done and indicate the degree of responsibility that has been placed upon him.

7. If the record of the work done and the thesis be accepted by the Faculty, the candidate, upon notification, must present himself for examination not later than the Saturday preceding the annual commencement. The examination shall consist of oral questions on the subject-matter of the thesis and on the work done by the candidate since graduation.

### MASTER OF SCIENCE.

The degree of Master of Science will be conferred on graduate students who fulfill the following requirements:

1. The candidate must have received the bachelor's degree from this College or another institution at which the course of study is recognized as fully equivalent.

2. Not less than one year must intervene between the conferring of the bachelor's degree and the master's degree.

3. A course of study consisting of one major and two minor subjects, aggregating fifteen periods, must be pursued by residents at the College for not less than one year.

4. The major subject, covering seven periods, shall be strictly graduate work and selected in that department in which the bachelor's degree has been taken.

5. The two minor subjects, aggregating eight periods, shall be chosen from departments allied to the department in which the major subject is taken. The work of the minor subject shall be of a grade not lower than that of the junior year in these departments. Work for which the applicant has received credit towards the bachelor's degree shall not be accepted for credit toward the master's degree.

6. A satisfactory thesis must be presented, the theme of which must be approved by October 5th, and previous to his final examination the candidate shall be examined on his thesis and related subjects by a committee composed of professors in charge of the major and minor subjects and two professors in other departments designated by the Faculty.

7. In case the applicant be teaching or working for the College, he shall not be allowed to carry more than one-half of his work at one time, and no work done for the College as instructor shall be credited towards his degree.

#### FORM OF THESIS.

The thesis must be presented on unruled, white paper,  $8\frac{1}{2}$  x 11" in size, twenty-pound Persian bond or the equivalent. A suitable title page, printed or typewritten, must be prepared. The thesis must be neatly typewritten, properly paged, leaving a margin of  $1\frac{1}{2}$ " on the left for binding, the writing to be on one side of the page only. All drawings or diagrams must be neatly and carefully prepared and where the size of paper necessary is larger than that of the page it must be of such size as conveniently to fold in with the thesis.

The thesis shall become the property of the College and will be placed on file.

## BOOKS GIVEN TO THE LIBRARY, 1912-1913.

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- Green, John B.: Law for the American Farmer.  
Summey, G. L.: Arithmetic.  
Weatherford, W. D.: Present Forces in Negro Progress.  
Graves, Bishop Anson R.: Farmer Boy Who Became a Bishop.  
Ogden, George C.: Poems, given by his family.  
Ohio State University: Stillman Williams Robinson.  
Brate, H. R.: Farmer Gas Engine.  
North Carolina Historical Commission: Pocket Manual of North Carolina.  
Thompson, Slason: The Railway Library, 1911.
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## DONATIONS.

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### To the Soils Department.

*Federal Chemical Company, Columbia, Tenn.*—Fifty-lb. bag each of Brown Phosphate Rock as mined and after grinding.

*Caraleigh Phosphate and Fertilizer Works, Raleigh, N. C.*—Sample jars of fertilizer materials.

### Department of Physics and Electrical Engineering.

*Carolina Power and Light Company, Raleigh, N. C.*—Set of pictures.

*Crocker-Wheeler Company, Ampere, N. J.*—Large photograph.

*Southern Power Company.*—Map of its system.

*W. M. Gallant.*—One Shallenberger ampere-hour meter; a section of submarine power cable.

The following publishers have presented the Department with books:

The D. Van Nostrand Company; The Macmillan Company; D. C. Heath & Co.; Ginn & Co.; Allyn & Bason; National Carbon Company.

The following companies have donated periodicals:

Electrical Review and Western Electrician Publishing Company;  
The McGraw Publishing Company; The Technical Publishing Com-

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#### To the Textile Department.

*General Electric Company, Schenectady, N. Y.*—Color-matching outfit.

*Hampton Manufacturing Company, Easthampton, Mass.*—Mercerized cotton yarns.

*New England Butt Company, Providence, R. I.*—Ring spinning travelers, loom filling forks.

*Eugene C. Andres, Boston, Mass.*—Samples of foreign cottons.

*Emmons Loom Harness Company, Laurence, Mass.*—Loom harness and reeds.

*Kallé & Co., New York.*—Collection of dyestuffs and pattern cards.

*Cassella & Co., New York.*—Collection of dyestuffs and pattern cards.

*Farberfabriken of Elberfeld Company, New York.*—Collection of dyestuffs and pattern cards.

*Berlin Aniline Works, New York.*—Collection of dyestuffs and pattern cards.

*Badische Company, New York.*—Collection of dyestuffs and pattern cards.

*Farbwerke-Hoechst Company, New York.*—Collection of dyestuffs and pattern cards.

*Geisenheimer & Co., New York.*—Sample dyes.

*American Dyewood Company, New York.*—Sample dyes.

*Draper Company, Hopedale, Mass.*—Supplies for twister frame.

*Clark Publishing Company, Charlotte, N. C.*—Mill directory.

*Davidson Publishing Company, New York.*—Textile directory.

*Textile Manufacturer, Charlotte, N. C.*

*Southern Textile Bulletin, Charlotte, N. C.*

*Mill News, Charlotte, N. C.*

*Wool and Cotton Reporter, Boston, Mass.*

*Fiber and Fabric, Boston, Mass.*

*Textile Manufacturers' Journal, New York.*

*New York Journal of Commerce, New York.*

*American Industries, New York.*

#### To the Modern Language Department.

*Classes in Modern Languages and Dr. A. Rudy.*—Six picture frames.

## CATALOGUE OF STUDENTS.

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<i>Name.</i>	<i>Post Office.</i>	<i>Course.</i>
CLAUDE SHUFORD ABERNETHY,	Hickory,	M. E.
WILLIAM CROCKER ALBRIGHT,	Mount Airy,	E. E.
OLIVER STANHOPE ANTHONY,	Shelby,	E. E.
JOSEPH ALEXANDER ARDREY,	Fort Mill, S. C.,	M. E.
JACK ATKINSON,	Asheville,	Tex.
CHARLES VERNON BAKER,	Raleigh,	C. E.
FRED ALLEN BAKER,	Kings Mountain,	E. E.
JOE OLIVER BARBREY,	Clinton,	C. E.
JERE WILSON BASON,	Swepsonville,	Agr.
ARTHUR BRYAN BASS,	Tarboro,	C. E.
MARVIN EDDLEMAN BEATTY,	Charlotte, R. 29,	C. E.
JOHNNIE SAMUEL BENNETT,	Morehead City,	E. E.
RALPH PURCELL BLANTON,	Mooresboro,	Agr.
JAMES SHEPHARD BONNER,	Washington,	E. E.
CHARLES KEMP BOREN,	Pomona,	M. E.
FRANCIS PAUL BOYLIN,	Wadesboro,	C. E.
JAMES FRANKLIN BRAWLEY,	Mooresville,	Agr.
EVERITT EDWARD BRIGGS,	Raleigh,	C. E.
CLAY DWIGHT BRITTAIN,	Summerfield,	M. E.
RALPH BROOKS,	Alliance,	Agr.
JAMES HEBER BROOKS,	Grifton,	Agr.
THOMAS WESTMORE BROOKS,	Stem,	M. E.
NOAH BURFOOT, JR.,	Elizabeth City,	Chem.
GORDON MCGREGOR CAMERON,	Manly,	Agr.
CLAUDIUS LEROY CARLTON,	Boykins, Va.,	E. E.
THOMAS SCHOOLFIELD CARTER,	Reidsville,	E. E.
WILLIAM ROY CATES,	Roxboro,	C. E.
JAY VICTOR CHAMPION,	Raleigh,	E. E.
COUNCIL CYRERIUS CLANTON,	Charlotte,	Chem.
CLETE WALTON CLARK,	Owassa, Ala.,	Agr.
WILLIAM THOMAS CLAYTON,	Laurinburg,	C. E.
AMBROSE SCHENCK CLINE,	Lincolnton,	Agr.
JOHN CALBOUN COLLIER, JR.,	Goldsboro,	M. E.
LESTER DURRETT COLTRANE, JR.,	Concord,	E. E.
CLIFFORD CAMERON COOKE,	Graham,	C. E.
WILLIAM SHAW CORBITT,	Henderson,	M. E.
ROBERT THOMAS COTTAM,	High Point,	M. E.
HENRY QUINN COVINGTON,	Laurinburg,	C. E.
SHERMAN GRADY CRATER,	Cycle,	Agr.
SIDNEY MOTT CREDLE,	Swan Quarter,	C. E.

<i>Name.</i>	<i>Post Office.</i>	<i>Course.</i>
CHESTER HANE CROWELL,	Newton,	M. E.
HERBERT MALCOLM CRUM,	Denmark, S. C.,	Agr.
RICHARD KELLY DAVENPORT, JR.,	Mount Holly,	Agr.
HERBERT JENNINGS DOCKERY,	Wadesboro,	Agr.
ARCHIE JAY DOOLITTLE,	Passaic, N. J.,	C. E.
JAMES DUNLOP DUVAL,	Manteo, Va.,	C. E.
HARRY ALFRED FAIN,	Murphy,	C. E.
JOHN ALEXANDER FARRIOR,	Raleigh,	Agr.
STEPHEN RALPH FETNER,	Hamlet,	C. E.
SAMUEL JAMES FISHER, JR.,	Asheville,	E. E.
MATTHEW MAURY FONTAINE,	Woodsdale,	E. E.
FRANK POWERS FONVIELLE,	Warsaw,	C. E.
HAROLD CLAY FOREMAN,	Elizabeth City,	Agr.
JOHN ALEXANDER FRAZIER,	Kings Creek,	M. E.
ZEBULON CLIFTON GARDNER,	Shelby, R. 6,	Agr.
ERIC LAMONT GARRETT,	Ahoskie,	Agr.
PETER MELVIN GILCHRIST,	Laurinburg, R. 4,	Agr.
AMZI NEALY GOODSON,	Concord,	E. E.
LAWSON WYATT GRANTHAM,	Newton Grove,	Agr.
DENNIS GRAY,	Guilford College,	Agr.
THOMAS FITZGERALD GRAY,	Winston-Salem,	M. E.
KENNETH LEE GREENFIELD,	Kernersville,	Agr.
WILLIAM TULL GHIMSLEY,	Greensboro,	Chem.
FRANK TAYLOR HAGOOD,	Ruffin,	Tex.
JOHN FLEMING HARRIS,	Mapleville,	M. E.
CHARLES HAYWOOD HAUGHTON,	Mount Airy,	M. E.
WILLIAM STEPHEN HAYWOOD,	Mount Gilead,	M. E.
GORDON HEATON,	Branchville, S. C.,	E. E.
ERNEST PERCY HEINZERLING,	Statesville,	E. E.
LEONARD ORR HENRY,	Gastonia,	E. E.
ERNEST KNOX HERMAN,	Wadesboro,	M. E.
EDGAR ALLEN HESTER,	Whiteville,	E. E.
ROBERT HUGH HILL,	Beaufort,	E. E.
HENRY MONTAGUE HILLIARD,	Scotland Neck,	C. E.
PAUL EUGENE HINE,	Old Town,	M. E.
RICHARD SEAWELL HINTON,	Raleigh,	M. E.
LEGAN HENRY HOBGOOD,	Speed,	E. E.
RALPH HINTON HODGES,	Washington,	Agr.
JOHN GILBERT HODGIN,	Red Springs,	Agr.
HOWARD HODNETT,	Wake Forest,	M. E.
THOMAS HALL HOLMES, JR.,	Goldsboro,	E. E.

<i>Name.</i>	<i>Post Office.</i>	<i>Course.</i>
LEWIS CLAUDIUS HOLT,	Burlington,	C. E.
HERNDON HOPKINS,	Greensboro,	Agr.
PAUL NOBLE HOWARD,	Kinston,	C. E.
JOHN GRAIER HUDGINS, JR.,	Beaufort,	E. E.
RAYMOND JEFFERSON HYATT,	Waynesville,	Agr.
THOMAS JEFFERSON INGRAM,	Wadesboro,	C. E.
SAMUEL O'KELLY IRELAND,	Elon College,	Agr.
JOHN LEBON JENKINS,	Charlotte,	E. E.
SIDNEY EARLE JENNETTE,	Lake Landing,	C. E.
JAMES ISAAC JENNETTE,	Regan,	Agr.
LEANDER BROWNLOW JOHNSON,	Hendersonville,	Chem.
VICTOR ALLISON JOHNSTON,	Mooreville,	Agr.
EUGENE CALHOUN JONES,	Raleigh,	Agr.
FITZHUGH CURRIE JONES,	Red Springs,	Agr.
JOHN FISHBLATE KATZ,	New York, N. Y.,	M. E.
HENRY CLAY KEARNS, JR.,	High Point,	Chem.
REX LIVINGSTON KELLY,	Sanford,	E. E.
WILLIAM FREDERICK KENDRICK,	Charlotte,	M. E.
WOODFORD ARMSTRONG KENNEDY,	Warsaw,	E. E.
WILLIAM PENDLETON KENNEDY,	Warsaw,	E. E.
JOHN DAVID KERNODLE, JR.,	Graham,	E. E.
LUTHER WILLIAM KIDD,	Rhodhiss,	Agr.
VIRGINIUS CLAIBORNE KILBY,	Danville, Va.,	Agr.
PAUL HANNER KIME,	Greensboro,	Agr.
WILLIAM JOSEPH KINCAID,	Wilson,	Tex.
RICHARD JOSHUA LAKE,	North Fork, Va.,	Agr.
JOHN HAYWOOD LANE,	Wilson,	Agr.
WILLIAM ALBERT LANE,	Goldsboro,	Agr.
EDWARD HARRIS LAYDEN,	Lexington,	Agr.
COLON ALONZO LEDFORD,	Casar,	Agr.
OWEN WOODFIN LEONARD,	Statesville,	M. E.
EDWARD SAVAGE LEWIS,	Seotland Neck,	M. E.
GWYN LENOIR LILLARD,	Charlotte,	Tex.
HENRY ALBERT LILLY,	Mount Gilead,	Agr.
THOMAS BAXTER LILLY,	Mount Gilead,	C. E.
ROBERT OPIE LINDSAY,	Madison,	Tex.
PRENTISS HORACE MCCALL,	Charlotte,	M. E.
GRAHAM MCEACHERN,	Red Springs,	Agr.
WILLIAM SIMPSON MCKIMMON,	Raleigh,	C. E.
HESTER RAYMOND MCLEAN,	Racford,	Agr.
CHARLES JOHNSON MCLEOD,	Biseoe,	C. E.

<i>Name.</i>	<i>Post Office.</i>	<i>Course.</i>
EDWARD LAURIE MCLEOD,	Red Springs,	Agr.
JAMES WALTER MCLEOD,	Rowland,	Agr.
MALCOLM LEE MCLEOD,	Maxton,	Agr.
FRANK COBLE MCNEILL,	Cameron,	E. E.
JAMES ALEXANDER MCPHERSON,	Cameron,	M. E.
ROBERT EDWARD MADISON,	Cullowhee,	E. E.
CHARLES BRIGGS MALONE,	Providence, R. I.,	M. E.
EDWARD HINES MARROW,	Red Springs,	E. E.
WILLIE EDWARD MARSH,	Aulander,	C. E.
JOSEPH HENRY MASON,	Charlotte,	Tex.
GARLAND FRANKLIN MAYES,	Stem,	E. E.
ISAAC CHAUNCEY MEEKINS, JR.,	Manteo,	Agr.
TOMMY LEE MILLWEE,	Charlotte,	E. E.
THOMAS JERRY MOODY,	East Laport,	Tex.
CHARLES ALFRED MOORE,	Kinston, R. 2,	E. E.
HENRY FRANKLIN MOORE,	Statesville,	E. E.
EDWIN FEREBEE MORGAN,	Shawboro,	Agr.
CHARLES MILTON MORRIS,	Concord,	Agr.
WILLIAM FOWLER MORRISON,	Wilmington,	C. E.
BENJAMIN FRANKLIN MULLEN,	Charlotte,	C. E.
EDWARD MOSEBY MURRAY,	Charlotte,	E. E.
MILES GORRELL MYERS,	Yadkinville,	Agr.
JOHN FRANK NEELY, JR.,	Pineville,	Agr.
DAVID BENJAMIN NOOE,	Pittsboro,	Agr.
JOHN THOMAS NORWOOD,	Raleigh,	Agr.
MARSHALL FRED ORMAND,	Kings Mountain,	Agr.
WILLIAM MARSHALL OSBORNE,	Charlotte,	Tex.
REID ALLISON PAGE,	Biscoe,	Agr.
LEE PARKER,	Ahoskie,	C. E.
RUFUS GWYN PARLIER,	Ronda,	M. E.
CHARLES DUFFY PARTRICK,	Tampa, Fla.,	M. E.
WALTER VANCE PISTOLE,	Unionville,	Agr.
ROGER RHODES PITMAN,	Barnesville,	Agr.
JOHN BAILEY PRIDGEN,	Elm City,	C. E.
CHARLES JACOB PRUETT,	Shelby,	Agr.
WILLIAM ARTHUR PRUITT,	Calvert,	Agr.
JACK ADDISON PUREFOY,	Asheville,	Agr.
PARKER ROYALL RAND,	Garner,	Agr.
HENRY RANKIN,	Gastonia,	M. E.
LENOX DANIEL RAWLINGS,	Wilson,	M. E.
GEORGE WILLIAM RAWLINS,	Raleigh,	Tex.

<i>Name.</i>	<i>Post Office.</i>	<i>Course.</i>
LEWIS BANKS RAY,	Graham,	M. E.
HUGH CALVIN REA,	Matthews,	Agr.
JAMES TROY REDMON,	Marshall,	Agr.
VICTOR ARTHUR RICE,	Cleveland, Ohio,	Agr.
RAY MILLER RITCHIE,	Raleigh,	Agr.
LEROY LEO ROBerson,	Robersonville,	E. E.
CHAUNCEY HARDWICK ROBERTS,	Fletcher,	Agr.
PHILIP AUSTIN ROBERTS,	Red Springs,	M. E.
JOHN PAUL ROBERTSON,	Rowland,	E. E.
ZEB BLAINE ROBINSON,	Weaverville,	E. E.
TALMAGE VERNON ROCHELLE,	High Point,	Chem.
WILLIAM HAYWOOD ROGERS, JR.,	Raleigh,	C. E.
CHARLES REID RUSSELL,	Denton,	C. E.
OSCAR VEALIE RUSSELL,	Troy,	E. E.
HENRY FRED RUSH,	Raleigh,	Agr.
AUGUSTIN JOSEPH RUSSO,	Portsmouth, Va.,	C. E.
DAVID FLOYD SASSER,	Goldsboro,	M. E.
JESSE WOODSON SAUNDERS,	Reidsville,	C. E.
WALTER LEAK SCALES, JR.,	Rockingham,	M. E.
ORRION MAYBURN SCHLICHTER,	Vaughan,	M. E.
CLEMENT OSCAR SEIFERT,	New Bern,	C. E.
KARL SLOAN,	Statesville,	C. E.
BASCOM PIERCE SMITH,	Guilford College,	M. E.
CLIFTON EUGENE SMITH,	Cornelius,	Agr.
EVERETT LAWS SMITH,	Raleigh,	E. E.
JOHN FRANKLIN SMITH,	Wilmington,	Agr.
WILLIAM WEIR SMITH,	New York, N. Y.,	C. E.
HENRY JEROME STOCKARD, JR.,	Raleigh,	Chem.
BENJAMIN STRAUSS,	New York, N. Y.,	M. E.
DANIEL MCGILVARY TATE,	Norlina,	Agr.
REUBEN L. TATUM,	Cooleemee,	E. E.
ALFRED TENNYSON TAYLOR,	McCullers,	Agr.
CHARLIE LOVE TERRY,	Wilmington,	Agr.
SAM CHESTER THOMPSON,	Mebane,	C. E.
GEORGE EUGENE TRUST,	East Arcadia,	Agr.
GROVER WILLIAM UNDERHILL,	Knightdale, R. 1,	Agr.
JOHN SAMUEL UPTON,	Vein Mountain,	M. E.
LAWRENCE TYSON WADDILL,	Carthage,	E. E.
CHARLES HENRY WADSWORTH,	Concord,	Agr.
JESSE BURNS WARD,	Rowland,	Agr.
JAMES HUGH WARD,	Maecllesfield,	C. E.



<i>Name.</i>	<i>Post Office.</i>	<i>Course.</i>
JACOB OSBORNE WARE,	Kings Mountain,	Agr.
HARRY HYRNE WATTERS,	Wilmington,	E. E.
ELDRIDGE LEE WEATHERS,	Shelby,	Agr.
GEORGE HENDERSON WEBB,	Morehead City,	C. E.
LIDEY RAND WELLONS,	Smithfield,	Agr.
HARRY GRAVES WHEARTON,	Greensboro,	Agr.
RAYMOND BENJAMIN WHEATLEY,	Beaufort,	C. E.
GEORGE WHITSON,	Swannanoa,	E. E.
JOHN BYNUM WIGGINS,	Sunbury,	C. E.
JOHN FRANKLIN WILLIAMS,	Bessemer City,	E. E.
NOAH ROUSE WILSON,	Wilson's Mills,	C. E.
HERMAN ELTON WINSTON,	Youngsville,	E. E.
JAMES HARVEY WITHERS, JR.,	Broadway,	Agr.
FORREST EGAN WYSONG,	Greensboro,	M. E.

**SPECIAL.**

<i>Name.</i>	<i>Post Office.</i>	<i>Course.</i>
JOHN EUDY ARMFIELD,	Greensboro,	Textile.
DAVID HENRY BARLOW,	Tarboro,	Drawing and Math.
JOHN WESLEY BERGTHOLD,	West Raleigh,	English.
JOHN QUINCY JACKSON,	Raleigh,	Agriculture.
JOHN ROBINSON WINSTON,	West Raleigh,	German.

**TWO-YEAR COURSES.****First Year.**

<i>Name.</i>	<i>Post Office.</i>	<i>Course.</i>
LEA SANDRESS ALBRITTON,	Kinston,	Tex.
SAM ADELAIDE ALEXANDER,	Matthews,	Vet.
THOMAS McCAYL ANDERSON,	Tarboro,	Agr.
HARRY ADAMS BRADLEY,	Gastonia,	Agr.
JOSEPH FRANCIS BROTHERS,	Elizabeth City,	Agr.
ERNEST SINCLAIR CHESSON, JR.,	Elizabeth City,	Agr.
CLIFFORD COX,	Richlands,	Vet.
WILLIAM ALLEN DARDEN, JR.,	Ayden,	M. A.
JOHN SAMPLE DAVIS,	Charlotte,	Agr.
JOHN THOMAS DIXON,	Lowell,	Vet.
WILLIAM CALVIN DONNELL, JR.,	Sanford,	Agr.
MARVIN WOODARD EDMUNDSON,	Wilson,	Agr.
WILLIAM DeVANE FAISON,	Faison,	Vet.
STEPHEN SCOTT FEREBEE,	Shawboro,	Agr.

<i>Name.</i>	<i>Post Office.</i>	<i>Course.</i>
HOWARD ALBERTSON FLORA,	Elizabeth City,	Agr.
OWEN HAYWOOD GUION, JR.,	New Bern,	M. A.
DREW SUGG HARPER,	Snow Hill,	Vet.
JESSE ROBERT HILL,	Trinity,	Agr.
WILLIAM LAWRENCE HOUSE, JR.,	Scotland Neck,	Agr.
WALTER JONES HUNTLEY, JR.,	Wadesboro,	Agr.
FRED DUNCAN JEROME,	Poplar Branch,	M. A.
ROBERT A. KENT,	Lenoir,	M. A.
FREDERICK SWINDELL KLUTTZ,	Concord,	M. A.
ROBERT EDWARD LAWRENCE,	Statesville, R. 5,	Agr.
GOWAN GALES LIVENGOOD,	Mocksville,	Agr.
BARNEY GUNBY MCHENRY,	Monroe,	M. A.
ANGUS BLUE MCKINNON,	Laurinburg,	Agr.
MARTIN THOMAS MCKINNON,	Laurinburg, R. 1,	Agr.
JOHN WIGGINS MANNING,	Williamston,	Agr.
GRADY FIELDEN MILLER,	Laurel Springs,	Agr.
EWING STEVENSON MILLSAPS,	Statesville,	Agr.
SAMUEL JOHN MITCHNER, JR.,	Garner,	M. A.
LEE HYMON MOORE,	Grifton, R. 1,	Agr.
HORACE ZACHARY MOSES,	Ellijay,	Vet.
SIM AARON NATHAN,	Wilmington,	Vet.
JAMES CARTER PERRY,	Durant's Neck,	M. A.
ED. SPEAR PHILLIPS,	Ingalls,	Vet.
JESSE ANDERSON REEVES,	Charlotte,	M. A.
JOHN AULD ROBINSON, JR.,	Wadesboro,	M. A.
CHARLES FRANK SLAGLE,	Franklin,	M. A.
STANLEY SMITH,	Gates,	Agr.
EVANS CRABTREE SPARROW,	Lowell,	M. A.
JOHN HENRY SPEAS,	East Bend,	Agr.
EDWIN PRENTISS STANTON,	Parkton,	Vet.
BRUCE STROWD,	Chapel Hill,	M. A.
AUBREY LANE TARKENTON,	Woodard,	Agr.
WILLIE MATHREW TROTT,	Newton,	Tex.
LONNIE BASCOM WARD,	Mocksville, R. 2,	M. A.
HENRY THOMAS WATKINS,	Blanch,	Agr.
GRADY LEE YOUNG,	Micaville,	Tex.

**Second Year.**

DEAN RONEY HOLT,	Graham	M. A.
WILLIAM CLOSS KNOX,	Town Creek,	Vet.
LOLA ROWE LEFFERS,	Gloucester,	M. A.

<i>Name.</i>	<i>Post Office.</i>	<i>Course.</i>
JULIUS ISAAC NEAL,	Madison,	Vet.
GEORGE FLETCHER PATE,	Gibson,	M. A.
THOMAS CARLYLE PATE,	Gibson,	M. A.
PAUL DUNSTON SMITH,	Merry Hill,	M. A.
BANKS COOPER TALLEY,	Statesville,	Vet.

**ONE-YEAR COURSE IN AGRICULTURE.**

<i>Name.</i>	<i>Post Office.</i>
JAMES LAWRENCE ADAMS,	Faison.
NATHANIEL ALEXANDER,	Charlotte, R. 9.
JOSEPH FAIRMAN ANDREWS,	Chalybeate Springs.
THOMAS BOONE ANDREWS,	Mount Gilead.
WILLIAM BENJAMIN AYCOCK,	Raleigh.
CHANCEY CARLTON,	Warsaw.
WHEELER MARTIN FIELDS,	LaGrange.
HOWARD TOWNSEND GUNN,	Rocky Mount.
SAMUEL RALPH HANEY,	Morganton.
WILLIAM RAY HIGHFILL,	Guilford College.
HARRY LEE HUDSON,	Shelby.
GROVER PHONSO JORDAN,	Edenton.
JOHN DUNCAN McARTHUR,	Parkton, R. 1.
DANIEL HUGH McCORMICK,	Parkton.
WILLIAM THOMAS MOSS,	Youngsville.
CLARENCE LELAND PASOUR,	Dallas.
CULLEN ADALI RHYNE,	Dallas.
GEORGE WHITENER RHYNE,	Catawba.
CHARLES EDMOND WHITE,	Hertford.

**WORK COURSE—AGRICULTURE.****First Year.**

SHUFORD GRAY ADAMS,	Yadkinville.
EARL EMMETTE ALLISON,	Concord.
DAVID LEMUEL CHERRY,	Mount Olive.
GEORGE MARK GOFORTH,	Lenoir, R. 4.
ALBERT ALEXANDER GRAVES,	Cana.
CLIFTON HAYS MCGINN,	Charlotte, R. 1.
ALBERT WALKER MASSEY,	Barium Springs.
WILLIAM RANSOM MIDDLETON,	Garner.
ZACHARIAH ENNIS MURRELL, JR.,	Wilmington.
JAMES ROBERT POPE,	Mount Mourne.
DONALD PAYNE SMITH,	Concord.
ROBERT MCKINLEY STAFFORD,	Harrisburg, R. 1.

<i>Name.</i>	<i>Post Office.</i>
FRANK McANALLY TOWNSEND,	Greensboro, R. 4.
MARION GRAY VANN,	Fayetteville.
JOEL BATTLE WETMORE,	Woodleaf.
PERCY STANLEY WHITE,	Greensboro.

**Second Year.**

FOY FISHER,	Concord.
JOHN HENRY HARDIN,	Waynesville, R. 3.
MALCOLM PERSON HOOVER,	Woodleaf.
WARREN MEWBORN LAUGHINGHOUSE,	Grifton, R. 1.
PARKS NORMAN,	Oxford.
JOHN WHITE RAMSEUR,	Kings Mountain.
CHARLES COMPTON RICHARDSON,	Snow Camp.
OSCAR DARIUS SEITZ,	Newton.
ADLAI CLINGMAN SHUFORD,	Barnardsville.
ROY DAVIS UNDERWOOD,	Salemberg.
MARION DARE WETMORE,	Woodleaf.
LYMAN ABBOTT WHITE,	Salemberg.

**WINTER COURSE—AGRICULTURE.**

FRED ANDERSON,	Hickory, R. 2.
ROBERT LEE AUSTIN,	Burnt Hill.
NAPIER HUMPHREY GOLDIE BALFOUR,	Lumber Bridge.
OTIS CORWIN BUNDY,	Jamestown.
NICHOLAS BODDIE BUNN,	Nashville.
WILLIAM HAMILTON CHESTER,	Davidson.
CORBETT CLARK COCKERHAM,	Good Springs.
WILLIAM EDWARD CROSLAND,	Rockingham.
PRENTISS DALRYMPLE,	Jonesboro.
CHARLIE BURLEYSON FISHER,	Rockwell.
JOHN CLIFTON FLOYD,	Louisburg.
SORSLY GAY,	Nashville.
ROBERT STERLING GRAVES,	Yanceyville.
JAMES CLEMENT IPOCK,	New Bern.
MRS. ALICE RIPLEY JONES,	Samarcand.
ALEXANDER OGDEN JONES,	Samarcand.
JOHN ELMER KLUTZ,	Gold Hill.
AUGUSTUS LEAZAR,	Moorestville.
JAMES BAITY McKEITHAN,	Regan.
EDWARD HUTTON MARRISON,	Raleigh.
LEO CRAMER MARSHALL,	Currie.
ALBERT TAILOR MORRIS,	New London.
JOSEPH ALGERNON MORRIS,	Oxford, R. 2.
FREDERIC THEODORE NELSON,	Rocky Mount.

# TWENTY-THIRD ANNUAL COMMENCEMENT

MAY, 1912.

## DEGREES CONFERRED.

### BACHELORS OF SCIENCE.

#### In Agriculture.

NEELY ORMOND ALEXANDER,	WALTER R. MANN,
CHARLES LEE CRUSE,	ARCHIE KNIGHT ROBERTSON,
RALPH WILKINSON HOWELL,	JAMES MCCREE SMITH,
STEPHEN COLE BRUNER,	TALMAGE HOLT STAFFORD,
JOHN GORDON KELLOGG,	NEEDHAM BRYAN STEVENS,
SAM JONES KIRBY,	JOHN SAM THOMPSON,
NATHAN DAVID HARGROVE.	

#### In Chemistry.

NEVIN GOULD FETZER,	JAMES RICHARD MULLEN,
WILLIS ASKEW HOLDING,	FLEMING BATES SHERWOOD,
CLARENCE ALEXANDER STEDMAN.	

### BACHELORS OF ENGINEERING.

#### In Civil Engineering.

ALAN THURMAN BOWLER,	HENRY BASCOM MERCER,
CLAYTON EDWARD BROWN,	CHARLES MCKEE NEWCOMB,
ERNEST COFIELD DERBY,	CHARLES WASHINGTON OWENS,
THOMAS FENNER GIBSON,	BRYANT MONROE POTTER,
ROBERT MCKENZIE HARDISON,	LOUIS NAPOLEON RIGGAN,
WILLIAM TALMAGE SHULL.	

#### In Electrical Engineering.

RALPH CAMPBELL DEAL,	THOMAS PINKNEY LOVELACE,
MCNEELY DUBOSE,	ALEXANDER HOLLADAY PICKEL,
RICHARD F. GIERSCH, JR.,	EDWARD PINKNEY SPEER,
WILLIAM HAYWOOD GRAHAM, JR.,	CULVER MURAT TAYLOR,
HARRY HARTSELL,	GEORGE REID TROTTER,
GEORGE LOGAN THOMPSON.	

**In Mechanical Engineering.**

ALLISON HODGES BOND,	ORUS WILDER SMITH,
CARL JOSHUA LAMBETH,	ARTHUR WILLIS TAYLOR,
CURTIS WILLIAMS LEE,	HERBERT LEE TAYLOR,
SIMON TURNER MITCHINER,	FRED BARNETT WHEELER.

**In Textile Industry.**

JAMES EDWARD MCGEE,	NEILL MCQUEEN.
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JAMES HOWARD BROWN, Course in Agriculture, Master of Science.

GUY PINNER, Course in Civil Engineering, Civil Engineer.

**HONORS.****HONORS IN SCHOLARSHIP.****For Four Years.**

J. E. MCGEE,	R. M. HARDISON.
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**FOR 1911-1912.****Senior Class.**

N. O. ALEXANDER,	R. M. HARDISON,	O. W. SMITH,
A. H. BOND,	J. G. KELLOGG,	A. W. TAYLOR,
C. L. CRUSE,	J. E. MCGEE,	H. L. TAYLOR.
T. F. GIBSON,	J. M. SMITH,	

**Junior Class.**

L. A. AMMON,	F. S. HALES,	R. S. MAUNEY,
E. D. BOWDITCH,	T. J. HEWITT,	R. T. MELVIN,
P. D. DAVIS,	T. R. HART,	G. T. ROWLAND.

**Sophomore Class.**

B. O. AUSTIN,	L. M. CRAIG,	J. F. SCHENCK,
C. R. BAILEY,	K. M. FETZER,	W. H. SMITH,
H. V. BIBERSTEIN,	JAMES FONTAINE,	R. S. SUGG,
E. C. BLAIR,	R. A. GILL,	Z. W. TAYLOR,
V. W. BREEZE,	M. L. LIVERMAN,	D. W. THORP, JR.,
J. R. BUCHANAN,	M. R. QUINERLY,	J. R. TOWNSEND,
D. D. COX,	J. B. REES,	E. W. WALDRUP,
S. J. COX,	T. L. ROBERSON,	J. W. WATTS, JR.
	D. E. ROBERTS,	

**Freshman Class.**

J. C. CARPENTER,  
L. P. DENMARK,  
R. H. FEILD,  
A. C. FLUCK,  
J. H. HALL, JR.,

R. W. HAMILTON, JR.,  
D. L. HOOPER,  
G. L. JEFFERS,  
W. F. KILPATRICK,  
F. K. KRAMER,  
W. D. MARTIN,

J. D. MILLER,  
J. D. RAY,  
L. C. ROSSER,  
P. E. SNEAD,  
B. WHITE.

**First-year Mechanic Arts.**

D. R. HOLT,

W. S. HAYWOOD.

**One-year Course in Agriculture.**

B. W. GAITHER,

H. SPENCER.

**Work Course in Agriculture.**

J. W. RAMSEUR.

**Honors for Punctuality.**

B. M. BLOUNT,  
W. G. CALDWELL,  
H. J. DOCKERY,  
R. H. FEILD,  
A. C. FLUCK,  
L. W. GARDNER,  
E. L. GRIFFITH,  
T. J. HEWITT,  
D. R. HOLT,  
D. L. HOOPER,  
W. R. HOOTS,

G. HUGHES,  
G. L. JEFFERS,  
M. LIFEROCK,  
T. G. MONROE,  
A. C. MORRISON,  
T. R. PARRISH,  
F. E. PATTON,  
C. C. PROFFITT,  
W. A. PRUITT,  
J. W. RAMSEUR,  
L. L. ROBERSON,

T. L. ROBERSON,  
D. E. ROBERTS,  
L. C. ROSSER,  
L. M. ROWE,  
G. T. ROWLAND,  
A. C. SHUFORD,  
O. W. SMITH,  
H. SPENCER,  
B. C. TALLEY,  
A. W. TAYLOR,  
W. M. WATSON.

## REGISTER OF ALUMNI.

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<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
DURANT STEWART ABERNETHY, Resident Engineer, Southern Ry.	B.E. 1906,	Lynchburg, Va.
LEROY FRANKLIN ABERNETHY, Abernethy Hardware Co.	B.Agr. 1905,	Hickory, N. C.
NELSON ADAMS, Farmer.	B.E. 1904,	McColl, S. C.
HAYWOOD LEWIS ALDERMAN, Division Superintendent in Operating Department, Southern Power Co.	B.E. 1904,	Greensboro, N. C.
KEMP ALEXANDER, Superintendent Acme Hosiery Mills.	B.E. 1900,	Asheboro, N. C.
NEILY ORMOND ALEXANDER, Farmer and Teacher.	B.S. 1912,	Matthews, N. C.
WILLIAM DAVIDSON ALEXANDER, JR., Engineer Mecklenburg Drainage Commission, and Chief Engineer, Partridge Metallurgical and Manufacturing Co.	B.S. 1899,	Charlotte, N. C.
DANIEL ALLEN, Farming and Real Estate.	B.S. 1896,	Raleigh, N. C.
GEORGE GILDEROY ALLEN, Overseer of Spinning, Jennings Cotton Mill, Inc.	B.E. 1906,	Lumberton, N. C.
LESLIE LYLE ALLEN, Cotton Merchant.	B.E. 1900,	Spartanburg, S. C.
ROBERT WILSON ALLEN, Superintendent of Schools.	B.E. 1893,	Sanford, N. C.
JOHN CAMILLUS APP, Real Estate, Insurance.	B.S. 1908,	Charleston, W. Va.
JOHN ALLEN AREY, M.S. 1910. Commissioner of Agriculture of Iredell County.	B.S. 1909,	Eimwood, N. C.
DORSEY FROST ASBURY, Leading Ordnance Draftsman, U. S. Naval Gun Factory.	B.S. 1898,	Washington, D. C.
GEORGE PAGE ASBURY, Assistant Engineer, Southern Ry.	B.E. 1906,	Washington, D. C.
SAMUEL ERSON ASBURY, M.S. 1896. Assistant State Chemist.	B.S. 1893,	College Station, Tex.
SYDNEY WOODWARD ASBURY, Heating Engineer and Architectural Draftsman, with Louis H. Asbury, Architect.	B.E. 1904,	Charlotte, N. C.



<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
THOMAS MARTIN ASHE, †	B.E. 1895,	Raleigh, N. C.
ROBERT JAMES AVERY, Superintendent Steam Shovel, Louisville and Nashville Railway Co.	B.Agr. 1905,	Morris, Ala.
ROBERT KENNETH BABINGTON, Engineering Department, Piedmont Telephone and Telegraph Co.	B.E. 1910,	Gastonia, N. C.
OSCAR LUTHER BAGLEY, Shipping Clerk, Virginia-Carolina Chemical Co.	B.S. 1905,	Selma, N. C.
EUGENE CLEVELAND BAGWELL, Assistant Engineer, Seaboard Air Line Ry.	B.E. 1904,	Portsmouth, Va.
EDWARD PAR BAILEY, President Wilmington Iron Works and General Manager Marine Railway Co.	B.E. 1904,	Wilmington, N. C.
WILLIAM BAILEY, Carolina Power and Light Co.	B.E. 1911,	Goldsboro, N. C.
FRANK OSCAR BALDWIN, Director of Settling Basins and Laboratory, Richmond City Waterworks.	B.S. 1908,	Richmond, Va.
WILLIAM HERBERT DOUGHTY BANCK, Junior Engineer, U. S. Engineer's Office, North Carolina District. In Charge of Survey, Harbor of Refuge, Cape Lookout.	B.E. 1909,	Beaufort, N. C.
IRA WILSON BARBER, Superintendent Electric Light and Power Plant and Waterworks.	B.S. 1899,	Mount Airy, N. C.
JAMES CLAUDIUS BARBER, Farmer.	B.E. 1904,	Barber, N. C.
TOLLIE CHESTER BARBER, Cliffside Mills.	B.E. 1911,	Cliffside, N. C.
WILLIAM WALTER BARBER, Farmer.	B.E. 1904,	Barber, N. C.
FLETCHER HESS BARNHARDT, Assistant Engineer, The Phoenix Bridge Co.	B.E. 1901,	Phoenixville, Pa.
WILLIAM ALEXANDER BARRETT, Electrical Engineer, Missoula Light and Water Co.	B.E. 1904,	Missoula, Montana.
GEORGE FRANCIS BASON, Specification Department, Crocker-Wheeler Co.	B.E. 1908,	Ampere, N. J.
HERBERT SCANDLIN BATTIE, Structural Draftsman, Virginia Bridge and Iron Co.	B.E. 1907,	Roanoke, Va.
JOHN MANN BEAL, Instructor in Botany, Miss. Agricultural and Mechanical College.	B.S. 1911,	Agr. College, Miss.
JAMES CLAUDIUS BEAVERS, Associate in Soils and Crop Extension, Purdue Agricultural Experiment Station.	B.Agr. 1906,	Lafayette, Ind.

†Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
SIDNEY HAMILTON BECK, *	B.S. 1898,	Washington, D. C. Marine Engine and Boiler Draftsman, Navy Department.
JOHN LELAND BECTON,	B.E. 1908,	Wilmington, N. C. Humphreys & Becton, Civil Engineers.
HARWOOD BEEBE,	B.E. 1908,	Big Lick, N. C. Assistant Engineer of Construction, Raleigh, Charlotte and Southern Ry.
CHARLES EDWARD BELL,	B.S. 1911,	Raleigh, N. C. Assistant Food Chemist, N. C. Department of Agriculture.
NEEDHAM ERIC BELL,	B.S. 1906,	Montgomery, Ala. Soil Surveyor, State of Alabama.
WILLIAM OSBORNE BENNETT, JR.,	B.E. 1901,	Maxton, N. C. Manager Eltha Manufacturing Co.
ROBERT LINN BERNHARDT,	B.S. 1900,	Salisbury, N. C. Secretary-Manager Salisbury Hardware and Furniture Co.
LESLIE GRAHAM BERRY,	B.E. 1900,	Charlotte, N. C. Manager Southern Engineering Co.
JOHN HENDERSON BIRDSONG,	B.S. 1899,	Chicago, Ill. Chief Chemist and Metallurgist, The National Malleable Castings Co.
JOE PITTMAN BIVENS, *	B.E. 1907,	New York, N. Y. Engineering Department, New York and Queens Electric and Power Co.
JAMES ADRIAN BIZZELL,	B.S. 1895,	Ithaca, N. Y. M.S. 1900. Ph.D., 1903, Cornell Univ. Prof. Soil Technology, N. Y. State College of Agriculture.
FRED McCULLOUGH BLACK,	B.E. 1910,	Wilksburg, Pa. Erecting Department, Westinghouse Electric and Manufacturing Co., East Pittsburg, Pa.
KENNETH LEON BLACK,	B.E. 1906,	Richmond, Va. Superintendent and Engineer, I. J. Smith & Co., Inc.
WILLIAM LAMAR BLACK,	B.E. 1908,	Charlotte, N. C. Southern Power Co.
JOHN ISHAM BLOUNT,	B.E. 1895,	Birmingham, Ala. C.E. 1897. J. I. Blount & Co., and The Blount Specialty Co.
WILLIAM MORTON BOGART,	B.E. 1903,	Dallas, Tex. Contracting Engineer, General Fire Extinguisher Co. of Texas.
ALLISON HODGES BOND,	B.E. 1912,	Goldsboro, N. C. Instructor Manual Training, Goldsboro Graded School.
THOMAS SAWYER BOND,	B.E. 1910,	Durango, D'go., Mex. Civil Engineer and Draftsman with the Mexican Government. Home Address, Windsor, N. C.
LESLIE NORWOOD BONEY,	B.E. 1903,	Florence, S. C. Architect.

\*Not heard from this year.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
FRED. WILHELM BONITZ, Lawyer, Engineering Dept. of Standard Oil Co.	B.E. 1901,	Wilmington, N. C.
HENRY EMIL BONITZ, Architect.	B.E. 1893,	Wilmington, N. C.
WILLIAM DAVID BOSEMAN, Farmer, with R. H. Ricks.	B.E. 1902,	Rocky Mount, N. C.
ZOLLY MOSBY BOWDEN, Electrician, Florida Mining Co.	B.E. 1901,	Mulberry, Fla.
ROY BOWDITCH, Operator, Southern Power Co.	B.E. 1910,	Charlotte, N. C.
ALAN THURMAN BOWLER, Reporter, The Raleigh Times.	B.E. 1912,	Raleigh, N. C.
ASA GRAY BOYNTON, Civil Engineer, Biltmore Estate.	B.E. 1908,	Biltmore, N. C.
CARL RAY BRADLEY, Motor Engineering Department, Wagner Electric Manufacturing Co.	B.E. 1910,	St. Louis, Mo.
JAMES WASHINGTON BRAWLEY, Director of Agents, Southern Life and Trust Co.	B.S. 1895,	Greensboro, N. C.
JOHN BENJAMIN BRAY, Resident Engineer, Raleigh, Charlotte and Southern Ry.	B.E. 1911,	Raleigh, N. C.
THOMAS JOHNSON BREVARD,* Twin City Transportation Co.	B.S. 1910,	St. Paul, Minn.
BENJAMIN ALEXANDER BROOM, Mechanical Inspector, Chicago, Burlington and Quincy R. R. Co.	B.E. 1905,	Lincoln, Neb.
CECIL DEWITT BROTHERS, Care Dep' to Construcion, National Railways of Mexico.	B.E. 1909,	Mexico City, Mex.
BEDFORD JETHRO BROWN, In Charge of Meter Department, Southern Power Co.	B.E. 1901,	Charlotte, N. C.
CLAYTON EDWARD BROWN, Levelman, Cincinnati, New Orleans and Texas Pacific R. R. Co.	B.E. 1912,	Erlanger, Ky.
FRANK HAMILTON BROWN, Teacher of Science, Cullowhee Normal and Industrial School.	B.Agr. 1908,	Cullowhee, N. C.
JOEL EDWARD BROWN,	B.S. 1911,	Pendleton, S. C.
JAMES HOWARD BROWN, M.S. 1912. Student, Kansas City Veterinary College.	B.S. 1911,	Kansas City, Mo.
WILLIAM BACHMAN BROWN, Raleigh, Charlotte and Southern Ry.	B.E. 1911,	Harrisburg, N. C.

\*Not heard from this year.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
STEPHEN COLE BRUNER, Agent, Office of Forest Pathology, Bureau of Plant Industry, U. S. Dept. of Agriculture.	B.S. 1912,	Raleigh, N. C.
THOMAS KINCAID BRUNER, Clerk, Virginia and Southwestern Ry. Co.	B.E. 1910,	Bristol, Va.
CARNEY JOHN BRYAN, Wholesale Fish Dealer.	B.E. 1907,	Panama City, Fla.
JOHN HARVEY BRYAN, Sales Department, Westinghouse Electric and Manufacturing Co.	B.E. 1908,	Wilksburg, Pa.
GUY KEDAR BRYAN, Civil Engineer, with J. P. Middlemas.	B.E. 1911,	Jacksonville, Fla.
KIT BRYAN, Assistant Resident Engineer, National Railways of Mexico.	B.E. 1911,	Sain Alto, Zacatecas, Mexico.
ELTON ELROY BUCK,*	B.E. 1910,	Hampton, Va.
JOSEPH SAMUEL BUFFALOE, Physician.	B.S. 1897,	Garner, N. C.
JOEL W. BULLOCK,* Farmer.	B.Agr. 1905,	Dabney, N. C., R. 1.
WALTER AUSTIN BULLOCK, Superintendent Porto Rico Leaf Tobacco Company's Cayey Plantations.	B.S. 1895,	Cayey, Porto Rico.
JAMES HARRY BUNN, Superintendent Henderson Cotton Mills.	B.E. 1900,	Henderson, N. C.
WILLIAM BRYANT BURGESS, Electrical Draftsman, Government Navy Yard, Norfolk.	B.E. 1908,	Portsmouth, Va.
WILLIAM ANDERS BUYS, Civil Engineer, The Interstate Cooperation Co.	B.E. 1906,	Belhaven, N. C.
VON PORTER BYRUM, Mechanical Engineer, Continental Gin Co.	B.E. 1911,	Charlotte, N. C., R. 3.
LINDSAY FERGUSON CARLTON, Electrical Engineer, John-Manville Electric Co.	B.E. 1907,	Pittsburg, Pa.
JOHN SAMUEL P. CARPENTER, Member Board of Directors and Superintendent Melville Manufacturing Co.	B.E. 1903,	Cherryville, N. C.
JOHN WILLIAM CARROLL, Physician.	B.S. 1897,	Wallace, N. C.
ROBERT HILL CARTER, Electrician, Isthmian Canal Commission.	B.E. 1907,	Corozal, Canal Zone.
HENRY BROZIER CARTWRIGHT, Assistant Engineer, Seaboard Air Line Ry.	B.E. 1905,	Jacksonville, Fla.

\*Not heard from this year.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
HENRY ROY CATES, U. S. Dept. of Agriculture, Bureau of Plant Industry.	B.S. 1911,	Washington, D. C.
JUNIUS SIDNEY CATES, M.Agr. 1904. Editor Southern Planter.	B.S. 1902,	Richmond, Va.
WILLIAM MILLER CHAMBERS, Auditor, W. M. Ritter Lumber Co.	B.E. 1905,	Maben, W. Va.
MARK HOPKINS CHESBRO, With Lakeview Rose Gardens.	B.Agr. 1906,	Jamestown, N. Y.
CONNOR CALHOUN CLARDY, Los Angeles Office, General Electric Co.	B.E. 1906,	Los Angeles, Cal.
CHARLES EDWARD CLARK, County Commissioner of Agriculture, Mecklenburg Co.	B.S. 1897,	Charlotte, N. C., R. 9.
DAVID CLARK, M.E. 1896, C.E. 1897. Owner and Editor Southern Textile Bulletin.	B.E. 1895,	Charlotte, N. C.
JAMES DUNCAN CLARK, President Peninsular Paper Co. Manager Ingleside Orange Groves.	B.S. 1906,	Tampa, Fla.
JOHN WASHINGTON CLARK, B.E. (Tex.) 1907. Superintendent of Erwin Bleaching and Furnishing Plant.	B.E. 1906,	West Durham, N. C.
THORNE MCKENZIE CLARK,* Resident Engineer, Piedmont Traction Co.	B.E. 1909,	Greenville, S. C.
WALTER CLARK, JR., Lawyer.	B.E. 1903,	Raleigh, N. C.
WILLIAM ALEXANDER GRAHAM CLARK, M.E. 1899. Commercial Agent, U. S. Dept. Commerce and Labor.	B.S. 1897,	Washington, D. C.
SAMUEL HERBERT CLARKE, With H. Clarke & Sons.	B.E. 1906,	Richmond, Va.
HENRY CALEB CLAY, Anaconda Copper Mining Co., B. and M. Divisions.	B.E. 1911,	Great Falls, Mont.
WILEY THEODORE CLAY, M.E. 1909. N. C. College of Agriculture and Mechanic Arts.	B.E. 1906,	West Raleigh, N. C.
ROBERT BAXTER COCHRAN, Chief Inspector, Bullock Electric Manufacturing Co.	B.E. 1902,	Norwood, Ohio.
ANSON ELIKEM COHOON, Forest Supervisor, Forest Service, U. S. Department of Agriculture.	B.S. 1898,	Eugene, Oregon.
JOHN ELIOT COIT, Professor of Citriculture and Semitropical Pomology, University of California.	B.Agr. 1903,	Berkeley, Cal.
PAUL COLLINS, Analytical and Consulting Chemist.	B.S. 1901,	New Haven, Conn.

\*Not heard from this year.

## REGISTER OF ALUMNI.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
GEORGE WASHINGTON CORBETT, JR., Proprietor, Corbett & Corbett, Saw and Planing Mills.	B.E. 1895,	Currie, N. C., R. 2.
SUMMEY CROUSE CORNWELL, Chief Engineer, Lafayette County Road Commission.	B.E. 1903,	Oxford, Miss.
CHARLES EDWARD CORPENING, Farmer and Lumber Dealer.	B.E. 1894,	Lenoir, N. C., R. 3.
LEWELLYN HILL COUCH, Superintendent, Yadkin River Power Co.	B.E. 1908,	Hamlet, N. C.
WALTER MILLER COWLES, In Charge of Mechanical Department, Fiat Auto Co., under E. J. Thompson Co.	B.E. 1909,	Pittsburg, Pa.
DAVID COX, Civil Engineer and Timber Dealer and Estimator.	B.E. 1894,	Hertford, N. C.
DUNCAN ARCHIBALD COX, Secretary-Treasurer and Salesman, Plensant-Cox Hardware Co.	B.S. 1906,	Rowland, N. C.
WILLIAM PESCUO CRAIG,	B.S. 1901,	Marion, N. C.
WILLIAM LOIS CRAVEN, Designer and Estimator, York Bridge Co.	B.E. 1901,	York, Pa.
CHARLES LESTER CREECH, Sales Manager, Spach Brothers Wagon Works.	B.S. 1903,	Winston-Salem, N. C.
ALEXANDER DOANE CROMARTIE, Farmer.	B.Agr. 1906,	Garland, N. C.
WILLIAM HENRY CROW, Superintendent Water, Light and Power Plant.	B.E. 1910,	Monroe, N. C.
CHARLES LEE CRUSE, Student, Kansas City Veterinary College.	B.S. 1912,	Kansas City, Mo.
FELIX GRAY CRUTCHFIELD, Secretary and Treasurer Maynard-Crutchfield Co., Heating Engineers and Plumbers.	B.E. 1901,	Winston-Salem, N. C.
EUGENE ENGLISH CULBRETH, Commercial National Bank.	B.E. 1903,	Raleigh, N. C.
HUGH McCULLOM CURRAN, Forestry Service, Philippine Government.	B.S. 1898,	Manila, P. I.
EDWIN SPEIGHT DARDEN, Farmer. Bookkeeper for Stantonburg Supply Co.	B.S. 1895,	Stantonburg, N. C.
WALTER LEE DARDEN, Chief Draftsman, Seaboard Air Line Ry.	B.E. 1903,	Portsmouth, Va.
JOSEPH FRANK DAVIDSON, Electrical Department, Illinois Steel Co.	B.E. 1909,	Chicago, Ill.
GEORGE MASLIN DAVIS, Draftsman, Mechanical Engineer's Office, N. and W. Ry.	B.E. 1901,	Roanoke, Va.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
WILLIAM HURD DAVIS,	B.E. 1911,	Schenectady, N. Y.
	General Electric Co.	
WILLIAM EARLE DAVIS,	B.E. 1910,	East Pittsburg, Pa.
	Westinghouse Electric and Manufacturing Co.	
WILLIAM KEARNEY DAVIS,	B.E. 1895,	Marion, S. C.
	Superintendent Marion Manufacturing Co.	
CLAUD COUNCIL DAWSON,	B.E. 1908,	Mayesworth, N. C.
	Mayes Manufacturing Co.	
THOMAS THEODORE DAWSON,	B.E. 1910,	Grifton, N. C.
	Hardwood Timbers.	
RALPH CAMPBELL DEAL,	B.E. 1912,	Pittsfield, Mass.
	Student, General Electric Co.	
WILLIAM SAMUEL DEAN,	B.E. 1909,	Washington, D. C.
	Assistant Cotton Technologist, Bureau of Plant Industry, U. S. Dept. of Agriculture.	
ERNEST COFIELD DERBY,	B.E. 1912,	Fairmont, N. C.
	Surveyor, Beaufort County Lumber Co.	
LEWIS REINHOLD DETJEN,	M.S. 1911,	West Raleigh, N. C.
	N. C. Agricultural Experiment Station.	
EDWIN SEXTON DEWAR,	B.S. 1911,	Raleigh, N. C.
	Assistant Chemist, N. C. Department of Agriculture.	
JOSEPH CHARLES DEY,*	B.S. 1895,	Norfolk, Va.
JUNIUS FRANKLIN DIGGS,	B.S. 1903,	Rockingham, N. C.
	Planter and Merchant.	
CARLTON O'NEAL DOUGHERTY,	B.E. 1909,	North, S. C.
	Farmer.	
MCNEELY DU BOSE,	B.E. 1912,	Pedro Miguel, C. Z.
	Electrical Engineer, U. S. Government.	
FRED. ATHA DUKE,	B.E. 1909,	Portsmouth, Va.
	Civil Engineer, Seaboard Air Line Ry.	
JAMES LEONIDAS DUNN,	B.S. 1910,	Scotland Neck, N. C.
	Farmer.	
ALVIN DEANS DUPREE,	B.E. 1908,	Greenville, N. C.
	Manager Insurance Department, Moseley Brothers' Agency.	
RAYMOND ROWE EAGLE,	B.E. 1908,	New Bern, N. C.
	Civil Engineer.	
MINNIC LUTHER EARGLE,	B.Agr. 1908,	Columbia, S. C.
	The Brady-Eargle Co., Real Estate.	
JOHN IVEY EASON,	B.S. 1911,	Stantonsburg, N. C.
	Farmer.	

\*Not heard from this year.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JACOB TATUM EATON, †	B. Agr. 1907,	Farmington, N. C.
WILLIAM HUNT EATON,	B.S. 1909,	Raleigh, N. C.
	State Dairyman, Department of Agriculture.	
LATTA VANDERION EDWARDS,	B.E. 1906,	Pullman, Wash.
	C.E. 1911, Cornell Univ. Prof. of Railroad and Highway Engineering, Wash. State Col.	
SEBA ELDRIDGE,	B.E. 1907,	New York, N. Y.
	Investigator Charity Organization Society.	
TIMOTHY ELDRIDGE,	B.E. 1904,	Smithfield, N. C.
	Superintendent Electric Light Plant and Waterworks.	
TREOPHILUS THOMAS ELLIS,	B.E. 1903,	Henderson, N. C.
	Farmer.	
WELDON THOMPSON ELLIS,	B.E. 1906,	West Raleigh, N. C.
	M.E. 1908. Assistant Professor of Mechanical Engineering, N. C. College of Agriculture and Mechanic Arts.	
LEE BORDEN ENNETT,	B.S. 1895,	Cedar Point, N. C.
	Superintendent of County Public Schools and Farmer.	
ALBERT EDWARD ESCOTT,	B.E. 1906,	Charlotte, N. C.
	Secretary and Treasurer, The Mill News.	
WILLIAM CARLYLE ETHERIDGE,	B. Agr. 1906,	Ithaca, N. Y.
	M.S. 1908. Graduate Student and Assistant in Cornell University.	
BENJAMIN BRYAN EVERETT,	B. Agr. 1907,	Palmyra, N. C.
	M.S. 1912, University of Wisconsin. Farmer.	
JAMES BECKETT EWART,	B.E. 1906,	Harthorne, Ill.
	Western Electric Co.	
RALPH RINGGOLD FAISON,	B.S. 1909,	Manila, P. I.
	Lieutenant, Philippine Constabulary.	
WILLIAM ALEXANDER FAISON,	B.E. 1909,	Indiana Harbor, Ind.
	Chief Inspector No. 2 Shops, American Steel Foundries.	
ISAAC HERBERT FARMER,	B.E. 1908,	Portsmouth, Va.
	Assistant R. of W. Engineer, Seaboard Air Line Ry.	
JAMES WILLIAM FARRIOR,	B.E. 1904,	Kenansville, N. C.
	Physician.	
WILLIAM DOLLISON FAUCETTE,	B.E. 1901,	Portsmouth, Va.
	C.E. 1910. Chief Engineer, Seaboard Air Line Ry.	
ISAAC HENRY FAUST,	B.E. 1895,	Ramseur, N. C.
	Farmer and Contractor.	
BENJAMIN CAREY FENNELL,	B.S. 1898,	Atlanta, Ga.
	M.E. 1900. Engineer and Contractor. Also General Manager Paulding County Power Co., of Dallas, Ga.	

†Deceased.



<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JAMES LUMSDEN FEREBEE, Engineer, Hatton Contracting Co.	B.E. 1902,	Atlantic City, N. J.
BENJAMIN TROY FERGUSON, Farmer and Manager, Dr. S. H. Crocker.	B.Agr. 1908,	Stantonsburg, N. C.
JOHN DANIEL FERGUSON, †	B.E. 1903,	Bladenboro, N. C.
JOHN LINDSAY FERGUSON, Electrical Draftsman, Isthmian Canal Commission.	B.E. 1907,	Culebra, Canal Zone.
NEVIN GOULD FETZER, Assistant Chemist, N. C. Dept. of Agriculture.	B.S. 1912,	Raleigh, N. C.
WALTER GOSS FINCH, Junior Engineer, U. S. War Department.	B.E. 1905,	Washington, D. C.
WILLIAM WALTER FINLEY, Proprietor Win Wilkes Farm.	B.S. 1904,	Charlottesville, Va.
FRANK FULLER FLOYD, Vice President and Sales Manager, Jellico Coal Mining Co.	B.E. 1893,	Knoxville, Tenn.
FRANK LINDSAY FOARD, Farmer.	B.S. 1909,	Salisbury, N. C., R. 7.
RUFUS EUGENE FORBIS, Draftsman, Peter S. Gilchrist, Consulting Engineer.	B.E. 1910,	Charlotte, N. C.
HUGH PIERCE FOSTER, †	B.E. 1903,	Person County.
SHIRLEY WATSON FOSTER, Entomologist and Manager Insecticide Dept., General Chemical Co. of California.	B.Agr. 1906,	San Francisco, Cal.
GEORGE WASHINGTON FOUSHEE, Secretary and Treasurer, Dicks Laundry Co.	B.E. 1904,	Greensboro, N. C.
ELIAS VAN BUREN FOWLER, Farmer.	B.E. 1907,	Glenville, N. C.
ROSCOE LOOMIS FOX, Broker.	B.E. 1909,	Kansas City, Mo.
FRANCIS MARION FOY, †	B.S. 1899,	Scott's Hill, N. C.
CHARLES DUFFY FRANCES, Superintendent Richlands Graded Schools.	B.E. 1893,	Richlands, N. C.
GEORGE STRONACH FRAPS, Ph.D., Johns Hopkins Univ. State Chemist of Texas. Chemist Texas Experiment Station. President Association of Official Agricultural Chemists.	B.S. 1896,	College Station, Tex.
ELMO VERNON FREEMAN, Commercial Engineer, The Virginia Power Co.	B.E. 1911,	Charleston, W. Va.
PERCY LEIGH GAINNEY, M.S. 1910. Instructor in Botany, University of Missouri.	B.Agr. 1908,	Columbia, Mo.

\*Not heard from this year.

†Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
EDGAR WILLIAM GAITHER, First Assistant Chemist, Ohio Agricultural Experiment Station.	B.S. 1904,	Wooster, Ohio.
JAMES JERVEY GANTT, Concrete Inspector, City of Augusta.	B.E. 1910,	Augusta, Ga.
JUNICUS TALMAGE GARDNER, Shelby Insurance and Realty Co.	B.E. 1908,	Shelby, N. C.
OLIVER MAX GARDNER, Lawyer.	B.S. 1903,	Shelby, N. C.
CLEMENT LEINSTER GARNER, United States Coast and Geodetic Survey.	B.E. 1907,	Washington, D. C.
LEWIS PRICE GATTIS, Georgia and Florida Ry.	B.E. 1909,	Augusta, Ga.
EDWARD MOORE GIBBON, Consulting Engineer.	B.E. 1893,	Jacksonville, Fla.
NICHOLAS LOUIS GIBBON, General Engineer, Leonard Tufts.	B.S. 1897,	Lakeview, N. C.
SETH MANN GIBBS, Civil Engineer, Seaboard Air Line Ry.	B.E. 1908,	Jacksonville, Fla.
THOMAS FENNER GIBSON, Student, School of Architecture, Columbia University.	B.E. 1912,	New York, N. Y.
LAMAR CARSON GIDNEY, Superintendent Rutherfordton Light and Waterworks.	B.E. 1903,	Rutherfordton, N. C.
RICHARD F. GIERSCH, JR., Wireman, Transformer and Oil Switch, Isthmian Canal Commission.	B.E. 1912,	Pedro Miguel, C. Z.
LOVIC RODGERS GILBERT, Superintendent Caraleigh Mills Co.	B.E. 1907,	Raleigh, N. C.
RANSOM EATON GILL,†	B.E. 1910,	Raleigh, N. C.
ROY JOSEPH GILL, Chief of Survey Part, Bureau of Lands, Insular Government.	B.E. 1907,	Manila, P. I.
GEORGE WILLIAM GILLETTE, Foreman of Shops, Tidewater Power Co.	B.E. 1911,	Wilmington, N. C.
MAURICE MORDECAI GLASSER, Triumph Electric Co.	B.E. 1908,	Pittsburg, Pa.
JOHN HOWARD GLENN,†	B.E. 1903,	Crowder's Creek, N. C.
CHARLES WILLIS GOLD, Treasurer Jefferson Standard Life Insurance Co.	B.S. 1895,	Greensboro, N. C.
MOSES HENRY GOLD, Civil Engineer, Seaboard Air Line Ry.	B.E. 1908,	Portsmouth, Va.

†Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
ALBERT SIDNEY JOHNSTON GOSS, Assistant to Chief Engineer, Piedmont and Northern Lines.	B.E. 1909,	Charlotte, N. C.
JOHN DAVID GRADY, Farmer.	B.Agr. 1908,	Albertson, N. C.
ROBERT WALTER GRAEBER, Superintendent Ingletare Farm.	B.S. 1911,	Greenville, N. C.
WILLIAM HAYWOOD GRAHAM, JR., District Traffic Chief, Southern Bell Telephone and Telegraph Co.	B.E. 1912,	Macon, Ga.
ROBERT STRICKLER GRAVES, District Meter Specialist, General Electric Co.	B.E. 1907,	Cincinnati, Ohio.
CHARLIE POOL GRAY, Principal of Buxton Academy.	B.E. 1909,	Buxton, N. C.
GEORGE PENDER GRAY,* Commercial Traveler, Read Phosphate Co., of Nashville, Tenn.	B.S. 1893,	Tarboro, N. C.
JAMES MILLER GRAY, Assistant Director Farmers' Institutes, N. C. Department of Agriculture.	B.S. 1910,	Raleigh, N. C.
STERLING GRAYDON, Superintendent Atherton Mills.	B.E. 1905,	Charlotte, N. C.
ANDREW HARTSFIELD GREEN, JR., Commercial National Bank.	B.S. 1909,	Raleigh, N. C.
MARION JACKSON GREEN, Pattern-maker, The Cole Manufacturing Co.	B.S. 1896,	Charlotte, N. C.
ARTHUR WYNNS GREGORY, Sales Manager, Tien Tsai Office, British-American Tobacco Co.	B.S. 1906,	Shanghai, China.
PAUL STREWALT GRIERSON, Draftsman, Charles Cory & Son, New York.	B.E. 1904,	Newport News, Va.
JAMES PERRIN GULLEY, Traveling Salesman, Federal Gas Fixture Works, of Philadelphia.	B.E. 1904,	Raleigh, N. C.
EMIL GUNTER,* Engineering Department, Edison Electric Illuminating Co.	B.E. 1903,	Boston, Mass.
DORSEY YATES HAGAN, Surveyor.	B.E. 1908,	Greensboro, N. C.
HORACE LESTER HAMILTON, Technical Writer, N. W. Ayer & Son.	B.E. 1906,	Philadelphia, Pa.
WILLIAM ROY HAMPTON, Owner firm of W. H. Hampton & Son, Inc., Merchants and Bankers.	B.S. 1909,	Plymouth, N. C.
SAMUEL MERRILL HANFF, Episcopal Clergyman.	B.S. 1900,	Wadesboro, N. C.

\*Not heard from this year.

## REGISTER OF ALUMNI.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JOHN FREDERICK HANSELMAN, Mayo Land and Bridge Co.	B.E. 1906,	Richmond, Va.
GEORGE ROM. HARDESTY, Chief Engineer, State Hospital.	B.E. 1907,	Goldsboro, N. C.
PHILIP WILLIAM HARDIE, Surveyor.	B.E. 1907,	Greensboro, N. C.
JARVIS BENJAMIN HARDING, C.E. 1909. Reconnaissance Engineer, National Railways of Mexico.	B.E. 1904,	Mexico City, Mexico.
ROBERT MCKENZIE HARDISON, Student, Columbia University.	B.E. 1912,	New York, N. Y.
NATHAN DAVID HARGROVE, City Salesman, National Produce and Feed Co.	B.S. 1912,	Huntington, W. Va.
RICHARD HUGH HARPER, With Gwyn-Harper Manufacturing Co.	B.S. 1905,	Patterson, N. C.
GEORGE ROLAND HARRELL, The Grasselli Chemical Co.	B.S. 1900,	Grasselli, N. J.
JOHN WILLIAM HARRELSON, Instructor, N. C. College of Agriculture and Mechanic Arts.	B.E. 1909,	West Raleigh, N. C.
CEBURN DODD HARRIS, Manager Burley Tobacco Manufacturing Co., of Louisville, Ky.	B.S. 1897,	Anchorage, Ky.
GORDON HARRIS, Lighting Engineering Department, General Electric Co.	B.E. 1909,	Schenectady, N. Y.
THOMAS DEVIN HARRIS, Assistant Drainage Engineer, State Department of Agriculture.	B.E. 1911,	Raleigh, N. C.
WILLIAM HENRY HARRIS, M.E. 1896. Treasurer and Agent, Slater Manufacturing Co.	B.E. 1895,	Pawtucket, R. I.
HARRY HARTSELL, Commercial Work, Western Electric Co.	B.E. 1912,	Chicago, Ill.
FRANK HAWKS, Special Apprentice, Atlantic Coast Line R. R.	B.E. 1910,	Wilmington, N. C.
EDMUND BURKE HAYWOOD, Raleigh, Charlotte and Southern Ry.	B.E. 1910,	Raleigh, N. C.
THOMAS FREDERICK HAYWOOD,†	B.E. 1909,	Trenton, N. C.
JOKTOAN LAFAYETTE HEMPHILL, Commercial Engineer, General Electric Co.	B.E. 1907,	Schenectady, N. Y.
LEONARD HENDERSON, Transitman, Atlantic Coast Line R. R. Co.	B.E. 1909,	Dunnellon, Fla.
MAURICE HENDRICK, Overser Spinning, Cliffside Mills.	B.E. 1908,	Cliffside, N. C.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
LAWRENCE JAMES HERRING, Practicing Veterinary Medicine.	B.Agr. 1907,	Wilson, N. C. Kansas City Veterinary College.
JERE ISAAC HERRITAGE, Civil Engineer, John L. Roper Lumber Co.	B.E. 1905,	Jacksonville, N. C.
CLARENCE WILSON HEWLETT, M.A., Ph.D., Johns Hopkins. Magnetic Observer, Department of Research in Terrestrial Magnetism, Carnegie Institute, of Washington, D. C.	B.E. 1906,	On board "Carnegie."
RUFUS WILLIAMS HICKS, JR., Steam Heating Dept., American Machine and Manufacturing Co.	B.E. 1910,	Charlotte, N. C.
BASCOMBE BRITT HIGGINS, M.S. 1910. Assistant and Graduate Student in Botany, Cornell University.	B.S. 1909,	Ithaca, N. Y.
LYDA ALEXANDER HIGGINS, Agent in Dairying, Dairy Division, U. S. Department of Agriculture.	B.S. 1910,	Brookhaven, Miss.
JAMES ALLEN HIGGS, JR., C.E. 1910. Assistant Engineer, C. N. O. and T. P. Ry.	B.E. 1906,	Erlanger, Ky.
JERE EUSTIS HIGHSMITH, Farmer.	B.S. 1897,	Parkersburg, N. C.
DAVID RAYMOND HINKLE, Second Spinning Man, Exposition Cotton Mills.	B.E. 1911,	Atlanta, Ga.
DANIEL HARVEY HILL, JR., Associate Editor, Southern Textile Bulletin.	B.S. 1909,	Charlotte, N. C.
GUY FRANCIS HINSHAW, City Engineer of Winston.	B.E. 1907,	Winston-Salem, N. C.
GEORGE HERBERT HODGES, Superintendent Kyle Mine, H. C. Frick Coke Co.	B.E. 1904,	Fairchance, Pa.
LABAN MILES HOFFMAN, JR.,	B.E. 1905,	Dallas, N. C.
WILLIS ASKEW HOLDING, Chemist, Parker Chemical Co.	B.S. 1912,	Mount Pleasant, Tenn.
CHARLES BOLLING HOLLADAY, E. I. du Pont de Nemours Powder Co.	B.E. 1893,	Wilmington, Del.
WILLIAM NORMAN HOLT, Traveling Salesman, The Texas Co.	B.E. 1907,	Norfolk, Va.
BENJAMIN OLIVER HOOD, Structural Engineer, F. A. Burdett & Co., Consulting Engineers.	B.E. 1901,	New York, N. Y.
LOUIE LEE HOOD, Structural Steel Draftsman, Virginia Bridge and Iron Co.	B.E. 1910,	Roanoke, Va.
WAYNE ARINGTON HORNADAY, M.S. 1910. D.V.M., Kansas City Veterinary College, Veterinarian.	B.S. 1909,	Burlington, N. C.
JOHN HOWARD, Attorney at Law.	B.S. 1896,	Middlesboro, Ky.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JESSE McRAE HOWARD, Overser Dyeing, Gibson Manufacturing Co.	B.E. 1904,	Concord, N. C.
ROBERT IRVING HOWARD, Civil Engineer, National Railways of Mexico.	B.E. 1904 (Tex.),	Ozuluama, Vera Cruz, Mexico.
RALPH WILKINSON HOWELL, Manager Bellhaven Ice and Light Plant.	B.S. 1912,	Belhaven, N. C.
BRANTON FAISON HUGGINS, Salesman, Gresham Manufacturing Co., of Griffin, Ga.	B.E. 1904,	Macon, Ga.
HENRY ALLEN HUGGINS, Bookkeeper, George W. Huggins, Jeweler.	B.S. 1900,	Wilmington, N. C.
CHRISTOPHER MILLER HUGHES, B.S. 1899. Wholesale Lumber Dealer.	B.E. 1895,	Richmond, Va.
LLOYD RAINEY HUNT, Superintendent Lexington Light and Water Department.	B.E. 1905,	Lexington, N. C.
HILL McIVER HUNTER, Purchasing Agent, Proximity Manufacturing Co. and White Oak Mills.	B.E. 1904,	Greensboro, N. C.
MALCOLM BEALL HUNTER, President Acme Plumbing and Heating Co.	B.E. 1895,	Charlotte, N. C.
JOHN WILLIAM IVEY, Central of Georgia Ry. Co.	B.E. 1909,	Dublin, Ga.
WILLIAM COLBERT JACKSON, Farmer.	B.S. 1896,	Wake Forest, N. C.
EUGENE COLISTUS JOHNSON, Sawmilling and Farming.	B.E. 1903,	Ingold, N. C.
W. F. R. JOHNSON, Firm of Johnson & Johnson, Civil Engineers.	B.E. 1909,	Dillon, S. C.
ALBERT CARL JONES, D.V.S., Kansas City Veterinary College. Veterinarian, Meat and Milk Inspector.	B.Agr. 1907,	High Point, N. C.
FREDERICK JOHN JONES, Assistant Engineer, Louisville and Nashville R. R.	B.E. 1909,	Hartsells, Ala.
GARLAND JONES, JR., Oil Chemist, State Department of Agriculture.	B.S. 1900,	Raleigh, N. C.
ROBERT FRANK JONES, Assistant Resident Engineer, Atlantic Coast Line R. R.	B.E. 1910,	Wilcox, Fla.
WILLIAM WHITMORE JONES, Manager Franklin Telephone and Electric Co.	B.E. 1907,	Franklin, N. C.
CLYDE RAYMOND JORDAN, Owner and Operator of Lumber Plant.	B.E. 1910,	Currie, N. C.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JOHN GORDON KELLOGG, Teacher of Agriculture and Science, Monticello High School.	B.S. 1912,	Brown Summit, N. C.
MARTIN KELLOGG, Farmer.	B.Agr. 1901,	Sunbury, N. C.
CLYDE BENNETT KENDALL, Topographer, U. S. Geological Survey.	B.S. 1897,	Washington, D. C.
ALPHEUS ROUNTREE KENNEDY, Ship Draftsman, Fore River Shipbuilding Co.	B.S. 1898,	Quincy, Mass.
JAMES MATTHEW KENNEDY, Architect.	B.E. 1903,	Raleigh, N. C.
SYDNEY G. KENNEDY, Shop Foreman, Atlantic Coast Line R. R.	B.S. 1897,	Sanford, Fla.
ARTHUR TEMPLETON KENYON,	B.E. 1905,	Bradley Beach, N. J.
WILLIAM KERR, M.S. V. P. I. 1912. Farmer.	B.S. 1904,	Hayden, N. M.
LUTHER HILL KIRBY, Civil Engineer, Bureau of Lands.	B.E. 1910,	Manila, P. I.
SAM. JONES KIRBY, Graduate student, University of Missouri, Columbia, Mo.	B.S. 1912,	Columbia, Mo.
WILLIAM FRANKLIN KIRKPATRICK, B.Agr. 1905. Professor of Poultry Husbandry, Conn. Agricultural College.	B.E. 1904,	Storrs, Conn.
JOSEPH LAWRENCE KNIGHT, Pac Manufacturing Co., Naval Stores.	B.S. 1897,	Dewey, Fla.
STARR NEELY KNOX, Assistant Engineer, Southern Railway Co.	B.E. 1905,	Charlotte, N. C.
WILLIAM GRAHAM KNOX, Assistant Chemical Engineer, Western Electric Co.	B.S. 1906,	New York, N. Y.
JAMES HERRITAGE KOONCE, †	B.E. 1905,	Richlands, N. C.
LAFAYETTE FRANCK KOONCE, Veterinary Surgeon. D.V.M. Kansas City Veterinary College.	B.Agr. 1907,	Raleigh, N. C.
HERBERT WILLIAM KUEFFNER, Resident Engineer, Chicago, Milwaukee and St. Paul R. R.	B.E. 1908,	Perry, Iowa.
FREDERICK CREECY LAMB, Health Office (Chemist).	B.S. 1898,	El Paso, Tex.
CLAUDE MILTON LAMBE, Civil Engineer, North State Hydro-Electric Co.	B.E. 1908,	Raleigh, N. C.
CARL JOSHUA LAMBETH, Testing Gasoline Engines, Fairbanks-Morris Co.	B.E. 1912,	Beloit, Wis.

†Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
BENNETT LAND, JR., Division Engineer, Seaboard Air Line Ry.	B.E. 1903,	Tampa, Fla.
JOHN THOMAS LAND, Assistant Engineer, Seaboard Air Line Ry.	B.E. 1903,	Jacksonville, Fla.
MARK CLINTON LASITTER, Civil Engineer.	B.E. 1910,	Snow Hill, N. C.
JAMES EDWARD LATHAM, Lieutenant, Philippine Constabulary.	B.S. 1909,	Manila, P. I.
CHARLES EDWARD LATTA,	B.E. 1908,	Raleigh, N. C.
CURTIS WILLIAMS LEE, General Manager Monroe Mfg. Co.	B.E. 1912,	Monroe, N. C.
EUGENE TALMAGE LEE,	B.E. 1910,	Dunn, N. C.
JESSE JULIAN LILES, Salesman, Power and Mining Department, General Electric Co.	B.E. 1901,	Pittsburg, Pa.
HENRY MARVIN LILLY, Civil Engineer.	B.E. 1905,	Albemarle, N. C.
ERNEST EDWIN LINCOLN, Draftsman, The Phoenix Bridge Co.	B.E. 1904,	Phoenixville, Pa.
DAVID LINDSAY, Assistant Superintendent German-American Co.	B.E. 1908,	Draper, N. C.
JOHN HENRY LITTLE, Salesman, General Electric Co.	B.E. 1908,	Schenectady, N. Y.
ULPHIAN CARR LOFTIN, Assistant to Entomologist, Florida Agricultural Experiment Station.	B.S. 1910,	Gainesville, Fla.
RALPH LONG, Salesman, P. Lorillard Co.	B.S. 1909,	Greensboro, N. C.
LOUIS EDGAR LOUGEE, Jones & Laughlin Steel Co.	B.S. 1907,	Pittsburg, Pa.
LEWIS OMER LOUGEE, Civil and Mining Engineer, Member Firm, George S. Baton & Co.	B.E. 1901,	Pittsburg, Pa.
THOMAS PINKNEY LOVELACE, Foreman, Department of Maintenance, Southern Power Co.	B.E. 1912,	Charlotte, N. C.
JOE POINDEXTER LOVILL, †	B.E. 1906,	Mount Airy, N. C.
GEORGE LAFAYETTE LYERLY, Manager and Partner, Shuford Hardware Co.	B.E. 1908,	Hickory, N. C.
LIPSCOMBE GOODWIN LYKES,* Vice President, Lykes Brothers, Inc.	B.E. 1905,	Havana, Cuba.

\*Not heard from this year.

†Deceased.



<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
THOMPSON MAYO LYKES, Secretary and Treasurer, The Lykes Co.	B.E. 1906,	Tampa, Fla. Secretary Tampa Packing Co.
GEORGE GREEN LYNCH, JR., Draftsman, Atlantic Coast Line R. R.	B.E. 1905,	Wilmington, N. C.
ALBERT SYDNEY LYON, Superintendent Rocky Mount Public Works.	B.S. 1899,	Rocky Mount, N. C.
EDMOND SHAW LYTCH, Partner, Laurinburg Machine Co.	B.E. 1903,	Laurinburg, N. C.
WILLIAM McNEIL LYTCH, Partner, Laurinburg Machine Co.	B.E. 1893,	Laurinburg, N. C.
HENRY KREIGER McCONNELL, Assistant Chemist, Kentucky Tobacco Products Co.	B.S. 1907,	Louisville, Ky.
EUGENE RICHARD McCracken, Consolidated Cotton Duck Co.	B.E. 1911,	Baltimore, Md.
FRANK NEELY McDOWELL, Agronomist in Soils, N. C. Experiment Station.	B.S. 1910,	West Raleigh, N. C.
JAMES EDWARD McGEE, Assistant in Sample Department, Altavista Cotton Mills.	B.E. 1912,	Altavista, Va.
MALCOLM ROLAND MCGIRT, Farmer and Stock Raiser.	B.Agr. 1905,	Sanford, N. C., R. 2.
JOHN FAIRLY McINTYRE, Farmer.	B.E. 1904,	Laurinburg, N. C.
WALTER HOGE McINTYRE, Associate Chemist and Agronomist, Agricultural Experiment Station. and Professor of Soil Culture, University of Tennessee.	B.S. 1905,	Knoxville, Tenn.
SAMUEL CHRISTOPHER McKEOWN, Chief Engineer, Sumter Telephone Manufacturing Co.	B.E. 1895,	Sumter, S. C.
CHARLES McKIMMON, JR., Chemist, Tennessee Coal and Iron Co.	B.S. 1911,	Ensley, Ala.
JAMES McKIMMON, General Bookkeeper, Raleigh Banking and Trust Co.	B.E. 1904,	Raleigh, N. C.
JOHN LUTHER McKINNON, Farmer.	B.Agr. 1902,	Laurinburg, N. C.
JAMES WILLIAM McKOY, Civil Engineer and Merchant.	B.E. 1893,	Black Mountain, N. C.
HORACE SMITH McLendon, Farming.	B.Agr. 1906,	Wadesboro, N. C., R. 1.
LENNOX POLK McLendon, Lawyer. Graduate Student, University of N. C.	B.S. 1910,	Chapel Hill, N. C.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
WALTER JONES McLENDON, JR., President Capitola Manufacturing Co., of Marshall, N. C., and President Prendergast Cotton Mills of Prendergast, Tenn.	B.S. 1897,	Knoxville, Tenn.
OSCAR FRANKLIN McNAIRY, Assistant Engineer, Seaboard Air Line Ry. Home Address, Greensboro, N. C.	B.E. 1907,	Portsmouth, Va.
SAMUEL HUXLEY McNEELY, Commercial Engineer, General Electric Co.	B.E. 1909,	Pittsburg, Pa.
CHARLES HARDEN McQUEEN, Inspector Bitulithic Pavements, Warren Brothers Co.	B.E. 1901,	Boston, Mass.
NEILL McQUEEN, Superintendent of Machinery, Exposition Cotton Mills.	B.E. 1912,	Atlanta, Ga.
SAMUEL MACON MALLISON, Hardware Business.	B.E. 1909,	Washington, N. C.
CARROLL LAMB MANN, C.E. 1905. Civil Engineer and Assistant Professor, N. C. College of Agriculture and Mechanic Arts.	B.S. 1899,	West Raleigh, N. C.
LOUIS HENRY MANN, Dentist.	B.E. 1900,	Washington, N. C.
WALTER R. MANN, With A. C. Kendal, Seed Merchant.	B.S. 1912,	Cleveland, Ohio.
WILLIAM LEAKE MANNING, Rosemary Manufacturing Co.	B.E. 1910,	Rosemary, N. C.
CLARENCE TALMAGE MARSH, First Lieutenant, Coast Artillery Corps, U. S. A.	B.E. 1908,	Fort Wint, P. I.
WILLIAM ROYDAN MARSHALL, Salesman, Westinghouse Machine Co., of East Pittsburg, Pa.	B.E. 1909,	New York, N. Y.
JACOB LEE MARTIN, Engineering Department, Florida East Coast Ry. Home Address, Graham, N. C.	B.E. 1911,	Marathon, Fla.
RALPH CECIL MASON, Farmer.	B.S. 1909,	Harrellsville, N. C.
ARTHUR BALLARD MASSEY, First Assistant in Botany and Bacteriology in Clemson Agricultural College.	B.S. 1909,	Clemson College, S. C.
WALTER JEROME MATHEWS, Contractor and Builder.	B.E. 1893,	Goldsboro, N. C.
RAYMOND MAXWELL, Civil Engineer.	B.E. 1906,	Belhaven, N. C.
MELVIN SOLOMON MAYES, Shaw Motor Co., Sumter, S. C.	B.E. 1910,	Sumter, S. C.
FRANK THEOPHILUS MEACHAM, M.S. 1894. Superintendent Experiment Station, U. S. Department of Agriculture.	B.S. 1893,	Statesville, N. C.

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<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
EUGENE FRANKLIN MEADOR, With Virginia City Motor Co.	B.E. 1907,	Danville, Va.
HENRY BASCOM MERCER, Draftsman, Chief Engineer's Office, Seaboard Air Line Ry.	B.E. 1912,	Portsmouth, Va.
REPTON HALL MERRITT, Secretary-Treasurer, Powell & Powell, Inc., Coal, Ice, and Wood.	B.S. 1897,	Raleigh, N. C.
ROBERT GRAHAM MEWBORNE, Chemist, Kentucky Tobacco Product Co.	B.S. 1896,	Louisville, Ky.
BENNETT TAYLOR MIAL, Assistant Engineer of Erection, McClintic-Marshall Construction Co., of Pittsburg, Pa.	B.E. 1907,	Pottstown, Pa.
FRANK CURTIS MICHAEL, Electrical Engineering and Construction.	B.E. 1907,	Charlotte, N. C.
DAVID JOHN MIDDLETON, Farmer.	B.Agr. 1908,	Warsaw, N. C.
JOSEPH ALFRED MILLER, JR., Manager Miller Supply Co.	B.E. 1904,	Brevard, N. C.
WALKER MOREHEAD MILLNER, Assistant Superintendent, Rhode Island Mills Co.	B.E. 1909,	Spray, N. C.
JOHN MAPLE MILLS, Sales Manager, Carolina Garage and Motor Co.	B.E. 1907,	Raleigh, N. C.
SIMON TURNER MITCHNER, International Harvester Co.	B.E. 1912,	Milwaukee, Wis.
BENJAMIN FRANKLIN MONTAGUE, Draftsman, Carolina, Clinchfield and Ohio Ry.	B.E. 1909,	Johnson City, Tenn.
HENRY STARBUCK MONTAGUE, Assistant Chemist, Mississippi State Laboratory.	B.S. 1907,	Agr'l College, Miss.
LEON DAVIS MOODY, Chief Engineer, Interstate Chemical Corporation.	B.E. 1910,	Charleston, S. C.
EUGENE BOISE MOORE, Apprentice, Allis-Chalmers Co.	B.E. 1910,	Norwood, Ohio.
LACY MOORE, Assistant Engineer, Southern Railway.	B.E. 1906,	Washington, D. C.
JAMES OSCAR MORGAN, M.S.A. 1907, Ph.D. 1909, Cornell Univ.	B.Agr. 1905,	College Station, Tex. Prof. of Agronomy, Texas A. and M. College.
ROBERT LEE MORGAN,	B.E. 1910,	Silver City, N. M.
JESSE JOHN MORRIS, Farmer.	B.E. 1903,	Weeksville, N. C.
WILLIAM FLAUD MORRIS, Instructor, N. C. College of Agriculture and Mechanic Arts.	B.E. 1909,	West Raleigh, N. C.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JOSEPH GRAHAM MORRISON,	B. Agr. 1906,	Stanley, N. C. Farming.
ROBERT HALL MORRISON,	B. E. 1900,	Charlotte, N. C. Highland Park Manufacturing Co.
ROBERT LEE MORRISON,	B. E. 1911,	Waco, Tex. Civil Engineer, Phoenix Construction Co.
JOHN LIGHTFOOT MORSON,	B. E. 1907,	Portsmouth, Va. Civil Engineer, Seaboard Air Line Ry.
WILLIAM FIELD MORSON,	B. E. 1904,	Mount Gillead, N. C. Resident Engineer, Raleigh, Charlotte and Southern Ry. Co.
LAURIE MOSELEY,	B. E. 1902,	Greensboro, N. C. Southern Agent, Owego Bridge Co., also President Carolina Concrete Co.
VASSAR YOUNG MOSS,	B. E. 1902,	Canonsburg, Pa. Draftsman, Fort Pitt Bridge Works.
HARRY YOEMANS MOTT,	B. S. 1910,	Mooreville, N. C. Farmer.
JAMES RICHARD MULLEN,	B. S. 1912,	Baltimore, Md. Chemist, Henderson Rubber Co.
LINDSLEY ALEXANDER MURR,	B. E. 1905,	Birmingham, Ala. Assistant Engineer, Seaboard Air Line Ry.
GARLAND PERRY MYATT,	B. S. 1905,	Brooklyn, N. Y. Works Chemist, Chas. Pfizer & Co.
O'KELLY W. MYERS,	B. S. 1899,	Brooklyn, N. Y. Assistant Engineer, Board of Water Supply, City of New York.
JESSE CLARENCE MYRICK,	B. E. 1906,	Pedro Miguel, C. Z. Electrical Foreman, Isthmian Canal Commission.
LEON ANDREWS NEAL,	B. E. 1904,	Roanoke, Va. Resident Engineer, Virginia Iron, Coal and Coke Co.
WILLIAM McCORMICK NEALE,	B. E. 1910,	Greenville, S. C. Chief Draftsman, Manufacturing Department, American Machine and Mfg. Co.
CHARLES McKEE NEWCOMB,	B. E. 1912,	Erlanger, Ky. Draftsman, Cincinnati, New Orleans and Texas Pacific Ry.
CHARLES ARTHUR NICHOLS,	B. E. 1902,	Muskogee, Okla. Manager Third Street Grocery Co.
CHARLES FRANKLIN NIVEN,	B. Agr. 1906,	Clemson College, S. C. Assistant Professor of Horticulture, Clemson College.
LOLA ALEXANDER NIVEN,	B. Agr. 1906,	Atlanta, Ga. Editor Orange Judd Southern Farming.
LEWIS MILTON ODEN,	B. Agr. 1906,	Raleigh, N. C. Proprietor Raleigh Creamery, Merchant and Truckee.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
THOMAS JEFFERSON OGBURN, JR., Everett Waddey Co.	B.E. 1906,	Richmond, Va.
ALBERT HICKS OLIVER,	B.S. 1897, Farmer.	Mount Olive, N. C.
SAMUEL LOFTIN OLIVER,	B.E. 1909, Superintendent Light and Water Plant.	Mount Olive, N. C.
JAMES ELWOOD OVERTON, Peanut Buyer and Salesman for American Peanut Corporation.	B.Agr. 1907,	Ahoskie, N. C.
DAVID STARR OWEN, General Superintendent Atlantic Turpentine and Refining Co.	B.E. 1903,	Mount Pleasant, Ga.
EDWIN BENTLEY OWEN, Registrar, N. C. College of Agriculture and Mechanic Arts.	B.S. 1898,	West Raleigh, N. C.
CHARLES WASHINGTON OWENS, Assistant Instrument Man, A. C. L. R. R. Home Address, Walstonburg, N. C., R. 1.	B.E. 1912,	Wilcox, Fla.
JOHN ALSEY PARK, Business Manager, The Raleigh Times.	B.E. 1905,	Raleigh, N. C.
B. MOORE PARKER, Assistant Professor, N. C. College of Agriculture and Mechanic Arts.	B.S. 1898,	West Raleigh, N. C.
CLYDE ESTER PARKER, Firm of Parker Bros. & Co., Cotton Brokers and Merchants.	B.S. 1906,	Raleigh, N. C.
EUGENE LEROY PARKER, Chemist and Manager, E. L. Parker & Co.	B.S. 1899,	Mt. Pleasant, Tenn.
JOHN HARVEY PARKER, Member Firm of Burrus & Co.	B.E. 1903,	New Bern, N. C.
JAMES LAFAYETTE PARKER, Assistant Engineer, Herbert C. Keith, Consulting Engineer.	B.E. 1902,	New York, N. Y.
JULIUS MONROE PARKER, Civil Engineer, Louisville and Nashville Ry. Co.	B.E. 1909,	Nashville, Tenn.
THOMAS FRANKLIN PARKER, M.S. 1908. Agriculturist, College of Agriculture.	B.Agr. 1907,	Mayaguez, Porto Rico.
FRED MAYNARD PARKS, Electrician, Westinghouse Electric and Manufacturing Co.	B.E. 1907,	Wilkinsburg, Pa.
JOHN GILBERT PASCHAL, Lumber Manufacturer.	B.E. 1909,	Apex, N. C.
ARTHUR LEE PASCHALL, Agriculturist for Olaa Sugar Plantation.	B.Agr. 1907,	Olaa, Hawaii.
WILLIAM FRANKLIN PATE, Instructor in Chemistry, N. C. College of Agriculture and Mechanic Arts.	B.S. 1901,	West Raleigh, N. C.
MANN CABE PATTERSON, Machinist, Patterson & Moore.	B.E. 1895,	Durham, N. C.

## REGISTER OF ALUMNI.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
ROBERT DONNELL PATTERSON, M.S. 1898. President The First State Bank.	B.S. 1894,	Chase City, Va.
WILLIAM JOEL PATTON, Electrician.	B.E. 1904,	Dallas, Texas.
CHARLES PEARSON, Member of Firm, Pearson Construction Co., General Contractors.	B.E. 1894,	Dothan, Ala.
FRED. TAYLOR PEDEN, Farmer.	B.S. 1911,	Wilkesboro, N. C.
JOHN TAYLOR PEDEN, JR., Apprentice, Westinghouse Electric and Manufacturing Co.	B.E. 1911,	Pittsburg, Pa.
JAMES HICKS PEIRCE, J. H. Peirce Manufacturing Co., Sash, Doors and Blinds.	B.S. 1905,	Warsaw, N. C.
WILLIAM CASPER PENNINGTON, The Amazon Cotton Mills.	B.E. 1910,	Thomasville, N. C.
SAMUEL OSCAR PERKINS, Soil Scientist, N. C. Department of Agriculture.	B.S. 1906,	Raleigh, N. C.
EUGENE GRAY PERSON,* Train Dispatcher, Central of Georgia Ry.	B.S. 1899,	Macon, Ga.
WILLIAM MONTGOMERY PERSON, Semet-Solvay By-product Coke Plant, of Ensley, Ala.	B.E. 1900,	Corey, Birm'g'm, Ala.
FREDERICK COLWELL PHELPS, Second Lieutenant, 12th U. S. Infantry.	B.E. 1904,	Monterey, Cal.
WILLIAM RANSOME PHILLIPS, Purchasing Agent, Carolina Power and Light Co.	B.E. 1910,	Raleigh, N. C.
ALEXANDER HOLLADAY PICKELL, With Carolina Power and Light Co.	B.E. 1912,	Raleigh, N. C.
PETER PENICK PIERCE, Engineering Department, Florida East Coast Ry.	B.E. 1909,	Marathon, Fla.
GUY PINNER, C.E. 1912. Assistant Engineer, with H. C. Keith, Consulting Engineer.	B.E. 1907,	New York, N. Y.
WINSLOW GERALD PITMAN, Superintendent City Water and Light Department.	B.E. 1907,	Lumberton, N. C.
PAUL NATHANIEL PITTENGER, With Carolina Power and Light Co. and Yadkin River Power Co.	B.E. 1911,	Raleigh, N. C.
BENJAMIN FRANKLIN PITTMAN, Chief Electrician for the E. J. and E. Ry. at Gary Station.	B.E. 1908,	Gary, Ind.
LAWRENCE LYON PITTMAN, Civil Engineer and Farmer.	B.E. 1908,	Whitakers, N. C.

\*Not heard from this year.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
PAUL MILLER PITTS,	B.E. 1909,	Lockhart, Ala.
	Jackson Lumber Co.	
ANGELO BETTLENA PIVER,	B.E. 1906,	Phoenixville, Pa.
	Structural Draftsman, Phoenix Bridge Co.	
WILLIAM CRAWFORD PIVER,	B.S. 1906,	New York, N. Y.
	Riches, Piver & Co., Chemical and Color Manufacturers, Hoboken, N. J.	
JAMES KEMP PLUMMER,	B.S. 1907,	Raleigh, N. C.
	M.S. 1909. M.A. 1911, Cornell University. Soil Chemist, State Department of Agriculture.	
PLEASANT H. POINDEXTER, JR.,	B.Agr. 1905,	Sharon, Okla.
	Manager, C. E. Sharp Lumber Co.	
RUBLE ISAAC POOLE,	B.E. 1908,	West Raleigh, N. C.
	Instructor, N. C. College of Agriculture and Mechanic Arts.	
EDWARD GRIFFITH PORTER,	B.E. 1905,	Balboa, C. Z.
	Transitman, Isthmian Canal Commission.	
JUNIUS EDWARD PORTER,	B.E. 1900,	Weldon, N. C.
	General Manager and Treasurer, J. E. Porter & Co., Railroad Contractors.	
BRYANT MONROE POTTER,	B.E. 1912,	Roper, N. C.
	Drainage Engineer, John L. Roper Lumber Co.	
HARRY ALEXANDER POWELL,	B.E. 1908,	Fernandina, Fla.
	Naval Stores Operator.	
JAMES ALEXANDER POWELL,	B.E. 1908,	Hampton, Va., R. 1.
	Engineer, Newport News Dry Dock and Shipbuilding Co.	
JOEL POWERS,	B.E. 1903,	Goldsboro, N. C.
	Draftsman, Dewey Brothers.	
THOMAS MILTON POYNER,	B.E. 1908,	Hamlet, N. C.
	W. R. Bonsal & Co.	
JAMES BRUCE PRICE,	B.E. 1910,	Cincinnati, Ohio.
	Erecting Engineer, Westinghouse Electric and Manufacturing Co.	
JOHN MOIR PRICE,	B.E. 1909,	Pittsburg, Pa.
	Salesman of Special Steels, Bethlehem Steel Co.	
HUGH WILLIAMS PRIMROSE, †	B.S. 1897,	Raleigh, N. C.
	M.S. 1900.	
ABRAM HINMAN PRINCE,	B.S. 1895,	San Augustine, Tex.
	Special Agent, U. S. Department of Agriculture.	
CHARLES MARCELLUS PRITCHETT,	M.E. 1895,	Manila, P. I.
	C.E. 1896. Chief Division Engineer, Insular Government.	
VICTOR VASHTI PRIVOTT,	B.E. 1895,	Suffolk, Va.
	Merchant.	

†Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JOSEPHUS PLUMMER QUINERLY, Assistant Dairy and Poultry Agent, Land and Industrial Dept., Southern Ry.	B.S. 1911,	Washington, D. C.
WILLIAM WALTER RANKIN, Fellow, Mathematics, University of N. C.	B.E. 1904,	Chapel Hill, N. C.
RISDEN PATTERSON REECE, Mechanical Engineer, American Portable Band-Saw Mill Co.	B.E. 1904,	Winston-Salem, N. C.
ROBERT RICHARD REINHARDT, D.V.M. Kansas City Veterinary College.	B.S. 1909,	Lincolnton, N. C.
WILLIAM BENEDICT REINHARDT, Electrician, Northern Light, Power and Coal Co.	B.E. 1902,	Dawson, Y. T., Canada.
ROGER FRANCIS RICHARDSON, Engineer, Somet-Solvay Co.	B.E. 1900,	Ensley, Ala.
WILLIAM RICHARDSON, JR., Assistant Chief Draftsman, Coal Mining Dept., Tennessee Coal, Iron and Railroad Co.	B.E. 1904,	Birmingham, Ala.
EDWARD HAYS RICKS, Cashier First National Bank.	B.E. 1903,	Roanoke Rapids, N. C.
LOUIS NAPOLEON RIGGAN, Building Inspector, Chicago, Milwaukee and St. Paul R. R. Co.	B.E. 1912,	Perry, Iowa.
ALFRED PRATTE RIGGS, Florida East Coast Ry.	B.E. 1909,	Key West, Fla.
ARCHIE KNIGHT ROBERTSON, Assistant in Boys' Corn Club Work, N. C. Department of Agriculture.	B.S. 1912,	West Raleigh, N. C.
DURANT WAITE ROBERTSON, Teller, Citizens Savings Bank.	B.E. 1906,	Washington, D. C.
JOSEPH HENRY ROBERTSON, North Carolina Public Service Co.	B.E. 1909,	Salisbury, N. C.
JAY FREDERICK ROBINSON, Draftsman, Fore River Shipbuilding Co.	B.E. 1910,	Quincy, Mass.
GASTON WILDER ROGERS, B.E. (Civil) 1905. Physician and Surgeon.	B.E. (Elec.) 1903,	Birmingham, Ala.
ZEBBIE GEORGE ROGERS, Ferguson & Rogers, Contracting and Engineering.	B.E. 1894,	Newark, Ohio.
JOHN WESLEY ROLLINSON, Mechanical Engineer. Member Washington Society Engineers and National Society of Marine Draftsmen.	B.E. 1911,	Zephyrhills, Fla.
WILLIAM EDWIN ROSE, Contractor.	B.E. 1900,	Washington, D. C.
CHARLES BURDETTE ROSS, Owner Lawton Coca-Cola Bottling Co.	B.E. 1903,	Charlotte, N. C.
FLOYD DE ROSS,	B.E. 1900,	Lawton, Okla.



<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
GRAEME ROSS, Apprentice, Westinghouse Electric and Manufacturing Co.	B.E. 1911,	Pittsburg, Pa.
GEORGE ROMULUS ROSS, Manager Farm for Roger A. Derby.	B.S. 1911,	Jackson Springs, N. C.
CARL COLLINS SADLER, Civil Engineer, Maintenance of Way Department, Southern Railway.	B.E. 1910,	Charlotte, N. C.
JAMES OLIN SADLER, Bridge Inspector, Seaboard Air Line Ry., Portsmouth, Va.	B.E. 1909,	Charlotte, N. C.
WILLIS HUNTER SANDERS, Electrician for Rosemary Manufacturing Co.	B.S. 1897,	Rosemary, N. C.
JOHN HYER SAUNDERS,* Locomotive Engineer, Atlantic Coast Line R. R.	B.E. 1894,	Rocky Mount, N. C.
IRA OBED SCHAUB, Professor of Agricultural Extension, N. C. College of Agriculture and Mechanic Arts.	B.S. 1900,	West Raleigh, N. C.
LEON JACOB SCHWAB, Engineer, U. S. Engineering Department.	B.E. 1907,	Savannah, Ga.
ROBERT WALTER SCOTT, JR., Assistant Director, Edgecombe Test Farm, N. C. Department of Agriculture.	B.Agr. 1905,	Rocky Mount, N. C.
EARLE ALOYSIUS SEIDENSPINNER, Lieutenant, Philippine Constabulary.	B.S. 1910,	Manila, P. I.
CARL DEWITT SELLARS, Sales Department, Cone Export and Commission Co.	B.E. 1893,	Greensboro, N. C.
JOHN WALDORF SEXTON, Engineering Department, Seaboard Air Line Ry.	B.E. 1910,	Portsmouth, Va.
CHARLES EDGAR SEYMORE,†	B.S. 1893,	Raleigh, N. C.
JAMES MORGAN SHERMAN, M.S. Univ. of Wisconsin, 1912. Instructor in Agricultural Bacteriology, University of Wisconsin. Home Address, McLean, Va.	B.S. 1911,	Madison, Wis.
FLEMING BATES SHERWOOD, Instructor in Chemistry, N. C. College of Agriculture and Mechanic Arts.	B.S. 1912,	West Raleigh, N. C.
FRANK WEBBER SHERWOOD, M.S. 1911. Graduate Student and Assistant in Soils Laboratory, Cornell University.	B.S. 1909,	Ithaca, N. Y.
ROBERT ARNOLD SHOPE, Lieutenant, Philippine Constabulary, Insular Government.	B.E. 1909,	Manila, P. I.
JOHN WADE SHORE, Cashier Commercial and Savings Bank.	B.S. 1900,	Boonville, N. C.
IRA SHORT, Apprentice, Westinghouse Machine Co., of East Pittsburg, Pa.	B.E. 1911,	Wilkinsburg, Pa.

\*Not heard from this year.

†Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JOHN HOUSTON SHUFORD, Expert and Salesman, Berlin Aniline Works.	B.S. 1903,	Charlotte, N. C.
JOHN OSCAR SHUFORD, Superintendent Electric Plant, Town of Lincolnton.	B.E. 1907,	Lincolnton, N. C.
WILLIAM TALMAGE SHULL, Civil Engineering, General Surveying.	B.E. 1912,	Beaufort, N. C.
ORIN MORROW SIGMON, Treasurer Piedmont Wagon and Manufacturing Co.	B.E. 1911,	Hickory, N. C.
GEORGE GRAY SIMPSON, Editor, Textile Manufacturer.	B.E. 1909,	Charlotte, N. C.
FREDERICK ERASTUS SLOAN, General Agent, Jefferson Standard Life Insurance Co.	B.S. 1899,	Charlotte, N. C.
WILLIAM NEVILLE SLOAN, Field Assistant, U. S. Government Forest Service.	B.E. 1909,	Townsend, Tenn.
ANDREW THOMAS SMITH, Mechanical Engineer, with Cumberland Glass Manufacturing Co.	B.S. 1899,	Bridgeton, N. J.
EDGAR ENGLISH SMITH, U. S. Coast and Geodetic Survey.	B.E. 1908,	Washington, D. C.
EDWIN HARRISON SMITH, Atlantic Coast Line R. R.	B.E. 1910,	Weldon, N. C.
EDWARD OSCAR SMITH, Order Department, Newport News Shipbuilding and Dry Dock Co.	B.E. 1901,	Newport News, Va.
JAMES LAWRENCE SMITH, JR., Inspector, Bridge Engineer's Office, Seaboard Air Line Ry.	B.E. 1908,	Portsmouth, Va.
JAMES MCCREE SMITH, Farmer.	B.S. 1912,	State Road, N. C.
JONATHAN RHODES SMITH, Chief Draftsman, The Jobson-Gifford Co.	B.E. 1905,	New York, N. Y.
ORUS WILDER SMITH, In Experimental Department, Foss Gas Engine Co.	B.E. 1912,	Springfield, Ohio.
WILLIAM TURNER SMITH, Farmer.	B.E. 1900,	Duke, N. C., R. 1.
THOMAS JEHU SMITHWICK, Consulting and Erecting Engineer.	B.S. 1897,	Mount Airy, N. C.
RUSSELL ELSTNER SNOWDEN, Highway Engineer, Craven County.	B.E. 1902,	New Bern, N. C.
CHARLIE AUGUSTINE SPEAS, Louisville and Nashville Ry.	B.E. 1911,	Hartsell, Ala.
EDWARD PINKNEY SPEER, Apprentice, Westinghouse Electric and Manufacturing Co., of East Pittsburg, Pa.	B.E. 1912,	Wilkinsburg, Pa.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JOHN FRANCIS SPEIGHT, †	B.E. 1910,	Whitakers, N. C.
JOHN DAVIDSON SPINKS, Junior Engineer, U. S. Engineering Department.	B. E. 1905,	East Arcadia, N. C.
JESSE PAGE SPOON, M.S. 1909. Veterinarian.	B.Agr. 1908,	Burlington, N. C. D.V.S. Kansas City Veterinary College.
ST. JULIAN LACHICOTTE SPRINGS, Farming for H. B. Short, and Traveling Salesman, Acme Mfg. Co., of Wilmington, N. C.	B.S. 1910,	Lake Waccamaw, N.C.
ERVIN BLACKENEY STACK, Member of Firm, J. E. Stack & Co.	B.E. 1905,	Monroe, N. C.
TALMAGE HOLT STAFFORD, Instructor and Athletic Director at Horner's Military School.	B.S. 1912,	Oxford, N. C.
CHARLES BURT STAINBACK, Sales Department, Westinghouse Electric and Manufacturing Co.	B.E. 1910,	East Pittsburg, Pa.
EDWARD ROE STAMPS, Superintendent, F. S. Royster Guano Co.	B.E. 1903,	Macon, Ga.
HARRIS INGRAM STANBACK, In Charge of Quality, General Electric Lamp Works.	B.E. 1910,	Newark, N. J.
NUMA REID STANSEL, E.E. 1901. Commercial Engineer, General Electric Co.	B.S. 1898,	Schenectady, N. Y.
THOMAS BARNES STANSEL, Farmer.	B.S. 1910,	Allenton, N. C.
CLARENCE ALEXANDER STEDMAN, Chemist, Virginia-Carolina Chemical Co.	B.S. 1912,	Richmond, Va.
ALEXIS PRESTON STEELE, Mechanical Engineer, Firm of J. C. Steele & Sons.	B.S. 1899,	Statesville, N. C.
HUGH STUART STEELE, Engineering Department, Chicago, Milwaukee and St. Paul Ry.	B.E. 1909,	Perry, Iowa.
LUCIUS ESEK STEERE, JR., Engineer, Wagner Electric Manufacturing Co.	B. E. 1911,	St. Louis, Mo.
SAMUEL FATIO STEPHENS, Draftsman, Structural Department, Cambria Steel Co.	B.E. 1909,	Johnstown, Pa.
NEDHAM BRYAN STEVENS, Graduate Student, N. C. College of Agriculture and Mechanic Arts.	B.S. 1912,	West Raleigh, N. C.
GEORGE YATES STRADLEY, Roanoke Bridge Co., Inc.	B.E. 1903,	Roanoke, Va.
JOHN SNIPES STROUD, Superintendent Lauderdale Cotton Mills.	B.E. 1908,	Meridian, Miss.

†Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
WALTER STEPHEN STURGILL, First Lieutenant of Field Artillery, U. S. Army. Assistant Instructor of Tactics, U. S. Military Academy.	B.E. 1901.	West Point, N. Y.
WILLIAM CLARK STYRON, On Steamship "Kansan," of the American-Hawaiian Line. Home Address, Washington, N. C.	B.E. 1910.	Washington, N. C.
TEISAKU SHUGISHITA,*	B.S. 1898.	Japan.
BEVERLY NATHANIEL SULLIVAN, Superintendent Winston-Salem Gas Co.	B.S. 1901.	Winston-Salem, N. C.
THOMAS BRYAN SUMMERLIN, Albritton & Summerlin, General Merchants.	B.E. 1910.	Calypso, N. C.
HENRY NEWBOLD SUMNER, Lieutenant Coast Artillery Corps, U. S. Army.	B.E. 1909.	Fort Dade, Fla.
LLOYD HURST SWINDELL, Southern Bell Telephone and Telegraph Co.	B.E. 1911.	Raleigh, N. C.
VANCE SYKES, Assistant Engineer, Seaboard Air Line Ry.	B.E. 1907.	Charlotte, N. C.
GEORGE FREDERICK SYME, C.E. 1907. Locating Engineer, Raleigh, Charlotte and Southern Ry.	B.S. 1898.	Raleigh, N. C.
WILLIAM ANDERSON SYME,† M.S. 1903. Ph.D., Johns Hopkins University.	B.S. 1899.	Raleigh, N. C.
FREDDIE JACKSON TALTON, Farmer.	B. Agr. 1906.	Pikeville, N. C., R. 2.
CLAUDE STRATON TATE, Secretary, Tate Machinery and Supply Co.	B.E. 1909.	Littleton, N. C.
ARTHUR WILLIS TAYLOR, Special Course with Carolina Power and Light Co.	B.E. 1912.	Raleigh, N. C.
CULVER MURAT TAYLOR, Apprentice, Westinghouse Electric and Machine Co.	B.E. 1912.	Wilkinsburg, Pa.
HERBERT LEE TAYLOR, Special Apprentice, B. and O. R. R.	B.E. 1912.	Baltimore, Md.
JAMES CLARENCE TEMPLE, M.S. 1908. Bacteriologist, Georgia Experiment Station.	B.S. 1904.	Experiment, Ga.
MALVERN HILL TERRELL, Chief Engineer, U. S. Post Office and Courthouse.	B.E. 1909.	Atlanta, Ga.
FRANK MARTIN THOMPSON, Athletic Coach, Wake Forest College. Home Address, Raleigh, N. C.	B.E. 1910.	Wake Forest, N. C.
GEORGE LOGAN THOMPSON, Electrician, General Electric Co.	B.E. 1912.	Lynn, Mass.

\*Not heard from this year.

†Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JOHN SAM THOMPSON,	B.S. 1912, Farmer.	Lewiston, N. C.
THOMAS HAMPTON THOMPSON,	B.E. 1910, Southern Railway.	Thomasville, N. C.
BUXTON WILLIAMS THORNE, †	B.E. 1893,	Holly Springs, Miss.
THOMAS WHITNELL THORNE,	B.E. 1911, Salesman, National Tube Co.	Atlanta, Ga.
LUTHER RUSSELL TILLET,	B.E. 1907, Assistant Engineer, Moro Province.	Zamboanga, P. I.
RICHARD HENRY TILLMAN,	B.E. 1906, Industrial Engineer, Consolidated Gas, Electric Light and Power Co.	Baltimore, Md.
WILLIAM SIDNEY TOMLINSON,	B.E. 1906, Civil Engineer, Shand Engineering Co.	Columbia, S. C.
JAMES EDWIN TOOMER,	B.S. 1909, Assistant Chemist, Tennessee Copper Co.	Copper Hill, Tenn.
CHARLES EDWARD TROTTER, †	B.S. 1903, M.D., Johns Hopkins University.	Franklin, N. C.
GEORGE REID TROTTER,	B.E. 1912, Student Engineer, General Electric Co.	Schenectady, N. Y.
WILLIAM BROOKS TRUITT,	B.E. 1907, Checker, Virginia Bridge and Iron Co.	Roanoke, Va.
FRED GOODE TUCKER,	B.E. 1911, Wisconsin State Highway Commission.	Madison, Wis.
ISAAC NORRIS TULL,	B.E. 1910, Construction Foreman, General Electric Co.	Cleveland, Ohio.
REID TULL,	B.E. 1906, Resident Engineer, Piedmont and Northern Lines.	Greer, S. C.
JOHN EDWIN TURLINGTON,	B.Agr. 1907, Principal Craven County Farm-Life School.	Vanceboro, N. C.
JOSEPH PLATT TURNER,	B.E. 1902, Vice President and Superintendent Lily Mills.	Spray, N. C.
WILLIAM HARRISON TURNER,	B.E. 1893, Wholesale Mill Feed, Hay and Grain.	Winston-Salem, N. C.
JACKSON CORPENING TUTTLE,	B.E. 1906, Sales Agent, General Electric Co.	New Orleans, La.
ROBERT PEELE UZZELL,	B.Agr. 1906, Farmer.	Goldsboro, N. C.

†Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
PETER VALAER, JR.,	B.S. 1906,	Washington, D. C.
	Assistant Chemist, Bureau Internal Revenue.	
LILLIAN LEE VAUGHAN,	B.E. 1906,	West Raleigh, N. C.
	M.E. 1909. M.E. 1911, Columbia University. Instructor in Mechanical Engineering, N. C. College of Agriculture and Mechanic Arts.	
SOLOMON ALEXANDER VEST,	B.S. 1900 (Chem.),	Mount Pleasant, Tenn.
	B.Agr. 1901. Secretary and Treasurer, The Smith Laboratory.	
SYLVESTER MURRAY VIELE,	B.E. 1905,	Altoona, Pa.
	Pennsylvania R. R. Co.	
JOHN LAWRENCE VON GLAHN,	B.E. 1908,	Wilmington, N. C.
	President Clarendon Construction Co.	
EDWIN THOMAS WADSWORTH,	B.E. 1911,	Erie, Pa.
	Student Engineer, General Electric Co.	
ROSCOE MARVIN WAGSTAFF,	B.E. 1900,	Norfolk, Va.
	Marine Engine and Boiler Draftsman, Machinery Division, U. S. Navy Yard.	
JOSEPH KENDALL WAITT,	B.E. 1904,	Mulberry, Fla.
	Chief Engineer, Prairie Pebble Phosphate Co.	
WALTER JENNINGS WALKER,	B.E. 1905,	Schenectady, N. Y.
	General Electric Co. Home Address, Winston-Salem, N. C.	
STEVEN DOCKERY WALL, †	B.E. 1905,	Rockingham, N. C.
CHARLES EMMETTE WALTON,	B.E. 1910,	Ampere, N. J.
	Specification Department, Crocker-Wheeler Co.	
BENJAMIN FRANKLIN WALTON,	B.S. 1894,	Raleigh, N. C., R. 1.
	Farmer.	
EDMUND FARRIS WARD,	B.Agr. 1907,	Smithfield, N. C.
	Abell & Ward, Lawyers.	
HUGH WARE,	B.S. 1899,	Kings Mountain, N. C.
	Farmer.	
CHARLES AUGUSTUS WATSON, †	B.S. 1901,	Raleigh, N. C.
JAMES HUNTER WATSON,	B.S. 1911,	Raleigh, N. C.
	Agent Atlantic Life Insurance Co., of Richmond, Va.	
JORDAN LEA WATSON, †	B.S. 1897,	Atlanta, Ga.
	M.E. 1899.	
WALTER WELLINGTON WATT, JR.,	B.E. 1905,	Charlotte, N. C.
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CECIL BERNARD WHITEHURST, Power Apparatus Specialist, Western Electric Co.	B.E. 1907,	Richmond, Va.
JOSEPH SLAUGHTER WHITEHURST, Civil Engineer, Norfolk Southern Ry.	B.E. 1909,	Elizabeth City, N. C.
EDWIN SEYMORE WHITING, †	B.E. 1903,	Hamlet, N. C.
GAITHER HALL WHITING, †	B.S. 1900,	Richmond, Va.
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HENRY LLOYD WILLIAMS, General Manager Mills, Cofield Manufacturing Co.	B.S. 1896,	Cofield, N. C.
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JOHN McCAMY WILSON, Refrigerating Engineer, Atlanta Ice and Coal Corporation.	B.E. 1894.	Atlanta, Ga.
JOHN SPICER WILSON, Electrician.	B.E. 1909.	Keokuk, Iowa.
WALTER BOOKER WINFREE, Farmer.	B.S. 1911.	Wadesboro, N. C., R. 3.
EDWARD LEIGH WINSLOW, United Fruit Co. Home Address, Hertford, N. C.	B.E. 1910.	Puerto Barrios, Guatemala.
LEWIS TAYLOR WINSTON, Accountant, General Offices, Stonega Coke and Coal Co., Inc.	B.Agr. 1906.	Big Stone Gap, Va.
HOWARD WISWALL, JR., Civil Engineer, Cooper River Corporation.	B.E. 1895.	Charleston, S. C.
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BRADLEY JEWETT WOOTEN, †	B.S. 1897.	Wilmington, N. C.
BENJAMIN VADEN WRIGHT, Chief Engineer, N. O. M. and C. R. R.	B.E. 1901.	Laurel, Miss.
MARION FULLER WYATT, Vice President Job P. Wyatt & Sons Co.	B.E. 1911.	Raleigh, N. C.
ROBERT JOB WYATT, Treasurer Job P. Wyatt & Sons Co.	B.E. 1909.	Raleigh, N. C.
CHARLES GARRETT YARBROUGH, District Superintendent of Service Department, Westinghouse Electric and Manufacturing Co.	B.E. 1895.	Los Angeles, Cal.
LOUIS THOMAS YARBROUGH, Register Clerk, Raleigh Post Office.	B.E. 1893.	Raleigh, N. C.
WOODFIN BRADSHAW YARBROUGH, Westinghouse Electric and Manufacturing Co.	B.E. 1908.	Los Angeles, Cal.
SAMUEL MARVIN YOUNG, Traveling Salesman, Supplee Hardware Co., of Philadelphia.	B.E. 1893.	Raleigh, N. C.
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