

THE
NORTH CAROLINA COLLEGE
OF
AGRICULTURE AND MECHANIC ARTS,
WEST RALEIGH.
1901—1902.



RALPHIGH:
E. M. UZZELL, STATE PRINTER AND BINDER.
1902.

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COLLEGE CALENDAR.

1902.

Thursday,	July	10,	{ Entrance examination at each county court-house, 10 A. M.
Wednesday,	September	3,	{ Entrance examination at the College, 9 A. M.
Thursday,	September	4,	First Term begins; Registration Day.
Thursday,	November	27,	Thanksgiving Day.
Tuesday,	December	22,	First Term ends.

1903.

Friday,	January	2,	Second Term begins; Registration Day.
Saturday,	March	14,	Second Term ends.
Monday,	March	17,	Third Term begins; Registration Day.
Saturday,	May	23,	Examinations end.
Sunday,	May	24,	Baccalaureate Sermon.
Monday,	May	25,	Alumni Day.
Tuesday,	May	26,	Annual Oration.
Wednesday,	May	27,	Commencement Day.

BOARD OF TRUSTEES.

(State Board of Agriculture).

S. L. PATTERSON, *President ex officio*, Raleigh.

T. K. BRUNER, *Secretary ex officio*, Raleigh.

J. B. COFFIELD, Everetts, First District.

E. L. DAUGHTRIDGE, Rocky Mount, Second District.

WM. DUNN, Newbern, Third District.

C. N. ALLEN, Auburn, Fourth District.

J. S. CUNINGHAM, Cuningham, Fifth District.

A. T. MCCALLUM, Red Springs, Sixth District.

J. P. McRAE, Laurinburg, Seventh District.

E. G. WAUGH, Dobson, Eighth District.

W. A. GRAHAM, Machpelab, Ninth District.

A. CANNON, Horse Shoe, Tenth District.

HOWARD BROWNING, Littleton.

J. A. JOYCE, Reidsville.

G. E. FLOW, Monroe.

J. C. RAY, Boone.

BOARD OF VISITORS.

W. S. PRIMROSE, *President*, Raleigh.

R. L. SMITH, *Secretary*, Albemarle.

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FRANK WOOD, Edenton.

MATT. MOORE, Kenansville.

W. H. RAGAN, High Point.

DAVID CLARK, Charlotte.

J. B. STOKES, Windsor.

W. J. PEELE, Raleigh.

J. FRANK RAY, Franklin.

CHARLES W. GOLD, Wilson.

GEO. T. WINSTON, *President of the College ex officio*.

FACULTY.

GEORGE TAYLOE WINSTON, A.M., LL.D., President and Professor of Political Economy.

† WILBUR FISK MASSEY, C.E., Professor of Horticulture.

WILLIAM ALPHONSO WITHERS, A.M., Professor of Chemistry.

DANIEL HARVEY HILL, A.M., Professor of English.

WALLACE CARL RIDDICK, A.B., C.E., Professor of Civil Engineering and Mathematics.

FREDERICK AUGUSTUS WEIHE, M.E., Ph.D., Professor of Physics and Electrical Engineering.

FREDERICK ELISHA PHELPS, Captain U. S. Army (retired), Professor of Military Science and Tactics.

HENRY MERRYMAN WILSON, A.B., Professor of Textile Industry.

CHARLES WILLIAM BURKETT, M.Sc., Ph.D., Professor of Agriculture.

THOMAS MURRITT DICK, U. S. Navy, Professor of Mechanical Engineering.

TAIT BUTLER, V.S., Professor of Veterinary Science.

BENJAMIN WESLEY KILGORE, M.S., Lecturer on Soils and Fertilizers.

ROBERT E. LEE YATES, A.M., Assistant Professor of Mathematics.

GEORGE STRONACH FRAPS, B.S., Ph.D., Assistant Professor of Chemistry.

FRANK LINCOLN STEVENS, M.S., Ph.D., Instructor in Biology.

CHARLES BENJAMIN PARK, Superintendent of Shops.

* JAMES ADRIAN BIZZELL, M.S., Instructor in Chemistry.

† ALEXANDER RHODES, Instructor in Horticulture.

WILLIAM ANDERSON SYME, B.S., Instructor in Chemistry.

THOMAS ALFRED CHITTENDEN, B.S., Instructor in Mechanical Drawing.

VIRGIL WILLIAM BRAGG, Instructor in Wood-working.

THOMAS NELSON, Instructor in Weaving and Designing.

† Resigned.

* Absent on leave during 1901—1902.

CHARLES LEMUEL FISH, B.S., Instructor in Civil Engineering.
 FRANKLIN SHERMAN, B.S.A., Instructor in Entomology.
 EDWIN BENTLEY OWEN, B.S., Instructor in English.
 WALTER STEPHEN STURGILL, B.E., Instructor in Mathematics.
 HARRY CASPAR WALTER, B.S., Instructor in Electrical Engineering.
 MARTIN EARLEY CARTER, Assistant in Wood-working.
 OLIVER CARTER, Assistant in Forge-work.
 JOHN CHESTER KENDALL, Assistant in Dairying.

OTHER OFFICERS.

EDWIN BENTLEY OWEN, B.S., Librarian.
 ARTHUR FINN BOWEN, Bursar.
 MRS. ELIZABETH VAN DER VEER DARBY, Stenographer.
 BENJAMIN SMITH SKINNER, Farm Superintendent and Steward.
 JAMES RUFUS ROGERS, A.B., M.D., Physician.
 MRS. DAISY LEWIS, Hospital Matron.

AGRICULTURAL EXPERIMENT STATION DEPARTMENT.

GEORGE TAYLOE WINSTON, A.M., LL.D., President.
 BENJAMIN WESLEY KILGORE, M.S., Director.
 WILLIAM ALPHONSO WITHERS, A.M., Chemist.
 WILBUR FISK MASSEY, C.E., Horticulturist.
 CHARLES WILLIAM BURKETT, M.Sc., Ph.D., Agriculturist.
 TAIT BUTLER, V.S., Veterinarian.
 GEORGE STRONACH FRAPS, Ph.D., Assistant Chemist.
 * JAMES ADRIAN BIZZELL, M.S., Assistant Chemist.
 BENJAMIN SMITH SKINNER, Assistant Agriculturist.
 † ALEXANDER RHODES, Assistant Horticulturist.
 HARRY PUTNAM RICHARDSON, B.S., Poultryman.
 ARTHUR FINN BOWEN, Bursar.
 MRS. ELIZABETH VAN DER VEER DARBY, Stenographer.

* Absent on leave during 1901—1902.

† Resigned.

MILITARY ORGANIZATION.

CAPTAIN FREDERICK E. PHELPS, U. S. Army (retired),
Commandant.

Staff.

RUSSELL E. SNOWDEN, Major.
B. BAXTER COCHRAN, First Lieutenant and Adjutant.
OLIVER CARTER, First Lieutenant and Quartermaster.

Non-commissioned Staff.

CHARLES L. CREECH, Sergeant-major.
HUGH P. FOSTER, Quartermaster Sergeant.
O. MAX GARDNER, Color Sergeant.

Band.

J. PLATT TURNER, Captain.
EUGENE T. ROBESON, First Lieutenant and Instructor.
WILLIAM A. PARKER, Second Lieutenant.
J. H. PARKER, First Sergeant.
H. L. ALDERMAN, Chief Musician.
D. R. FOSTER, Drum-major.

Company A.

JAMES L. FEREBEE, Captain.
WILLIAM D. BOSEMAN, First Lieutenant.
LESLIE N. BONEY, Second Lieutenant.
J. D. FERGUSON, First Sergeant.
L. GIDNEY, Second Sergeant.
E. S. LYTCH, Third Sergeant.
G. W. ROGERS, Fourth Sergeant.
J. H. GLENN, Fifth Sergeant.
*J. B. HARDING, First Corporal.
J. C. TEMPLE, Second Corporal.
E. S. HOGGARD, Third Corporal.
*E. C. CARRAWAY, Fourth Corporal.
*F. G. HARPER, Fifth Corporal.

Company D.

CLEVELAND D. WELCH, Captain.
JUNIUS S. CATES, First Lieutenant.
EUGENE E. CULBRETH, Second Lieutenant.

J. F. DIGGS, First Sergeant.
 W. L. DARDEN, Second Sergeant.
 W. T. ELLIS, Third Sergeant.
 C. E. TROTTER, Fourth Sergeant.
 J. M. KENNEDY, Fifth Sergeant.
 *C. T. ROGERS, First Corporal.
 *F. C. PHELPS, Second Corporal.
 *P. S. GRIERSON, Third Corporal.
 M. E. WEEKS, Fourth Corporal.
 M. E. MANLY, Fifth Corporal.

Company B.

VASSAR Y. MOSS, Captain.
 ROBERT I. HOWARD, First Lieutenant.
 WILLIAM B. REINHARDT, Second Lieutenant.
 S. W. ASBURY, First Sergeant.
 E. GUNTER, Second Sergeant.
 S. W. WHITE, Third Sergeant.
 E. S. WHITING, Fourth Sergeant.
 E. R. STAMPS, Fifth Sergeant.
 E. E. LINCOLN, First Corporal.
 J. A. MILLER, Second Corporal.
 J. M. LILES, Third Corporal.
 H. M. HUNTER, Fourth Corporal.
 J. Y. HEDRICK, Fifth Corporal.

Company C.

LAURIE MOSELEY, Captain.
 JAMES L. PARKER, First Lieutenant.
 J. HOUSTON SHUFORD, Second Lieutenant.
 S. C. CORNWELL, First Sergeant.
 W. M. BOGART, Second Sergeant.
 E. C. JOHNSON, Third Sergeant.
 D. S. OWEN, Fourth Sergeant.
 H. SIMPSON, Fifth Sergeant.
 *W. RICHARDSON, First Corporal.
 G. H. HODGES, Second Corporal.
 L. A. NEAL, Third Corporal.
 J. E. GULLEY, Fourth Corporal.
 E. P. BAILEY, Fifth Corporal.

*Color Corporal.

GENERAL INFORMATION.

The North Carolina College of Agriculture and Mechanic Arts owes its existence to the combined liberality of the United States Government and the late R. S. Pullen, of Raleigh, together with the patriotic efforts of a few far-sighted men who saw that, in the industrial life of North Carolina, the time had come when trained and educated leaders were necessary. The first act of the General Assembly of this State in relation to the College was introduced in 1885, the bill which afterwards became a law having been introduced by A. Leazar, Esq. The Congress of the United States in 1862 passed a bill introduced by Senator Justin S. Morrill of Vermont, giving to each State public lands "for the endowment, support, and maintenance of at least one college, whose leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions of life."

The income from this grant, amounting to \$7,500 annually, was appropriated in 1887 by the Legislature of the State for the establishment and yearly maintenance of this College. Sufficient land for the College site and farm was donated by the late R. S. Pullen. The College was formally opened for students October 1, 1889, with one building and five teachers.

Additional funds were provided afterwards by the National Congress for the support of the College and the State Agricultural Experiment Station, which is now a department of the College.

An annual appropriation of \$10,000 is made by the Legislature of North Carolina. With the exception of special appropriations, made from time to time by the Legislature, this is the only money received directly from 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 twelve deep wells. The water is analyzed both chemically and bacteriologically at regular periods.

The College now owns six hundred acres of land and thirteen buildings, and its teaching force consists of thirty persons. Its laboratories, drawing-rooms, and workshops are well equipped. Its library contains three thousand volumes, and its reading-room is well supplied with popular literary and technical journals.

BUILDINGS.

The Main Building is of brick, with brownstone trimmings, and is 70 by 60 feet; part four stories in height and the remainder two. The lower floors contain the offices of the President and the Bursar; the library; several recitation-rooms; chemical and physical laboratories, the chapel, and the armory. The upper stories are occupied by students.

In this, as in other buildings, every precaution has been taken to secure good sanitation. The rooms are all well lighted, well ventilated, and conveniently arranged.

The Mechanical Engineering Building is a plain, substantial, two-story brick building, with large annex. It contains the laboratories, drawing-rooms and recitation-rooms, and shops of the department.

The Boiler-house is a single-story brick building, containing boilers, fire-pump, and the machinery connected with the steam-heating plant.

Primrose Hall is a two-story brick building, which has attached a fine range of glass structures. The lower, or basement floor, is occupied by the Horticultural laboratory and boiler-room. The upper floor contains a large lecture-room and Botanical laboratory. The plant-houses are five in number, and are immediately accessible from the lecture-rooms and laboratories.

The Dairy and Barn are frame buildings, of modern design, and carefully planned for the purposes to which they are devoted. The barn is 50 by 72 feet and three stories high; the dairy is 20 by 40 feet and two stories high; the incubator-house has a stone basement for the incubators and store-room above. The brooder-house is fitted up with fine brooders.

The Textile Building is a two-story brick building 125 by 75 feet with a basement and was completed during the present college year. Its construction is similar to a cotton-mill, being 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.

Watauga Hall, which contained the kitchen, dining-room and several dormitory-rooms was destroyed by fire in November. It will be rebuilt and enlarged during the present year and be ready for occupancy in September.

Pullen Hall.—The Trustees have authorized the erecting of a building containing Library and Reading-rooms, a Dining-room for 500, an Auditorium for 800, and some Lecture-rooms. The building will be called Pullen Hall in honor of the late R. Stanhope Pullen.

The Infirmary is a two-story brick building, containing a sitting-room, seven bed-rooms, three bath-rooms, a kitchen, linen-room, doctor's office and medicine closet. The rooms are large, well ventilated, well lighted and heated with open fire-places. Each room opens upon a large, pleasant portico. The furnishing and equipment of the rooms are such as is suitable to hospitals.

Four two-story brick buildings are used exclusively for dormitories.

The College is supplied with a steam fire-pump, reservoir, hydrants, and fire hose to protect the building from burning.

THE AGRICULTURAL EXPERIMENT STATION.

The North Carolina Agricultural Experiment Station is a department of the College. It was established originally as a division of the State Department of Agriculture, in accordance with an act of the General Assembly, ratified March 12, 1877. Its work was greatly promoted by Act of Congress of March 2, 1877, which made a liberal donation to each State for the purpose of investigations in agriculture and for publishing the same. The bill which subsequently became a law was introduced by Representative Wm. H. Hatch of Missouri.

The Experiment Station offices and laboratories are located in the Main Building of the College. The horticultural experiment farm contains twenty-three acres, and is well equipped with barns and other necessary houses. For agricultural experiments, sufficient land is reserved on the College farm, about twenty-five acres being appropriated to this purpose annually. Publications for the benefit of truckers, nurserymen, stock men and other farmers are prepared by the Station and sent out free of charge to any one who desires them. A request to this effect, addressed "Agricultural Experiment Station, Raleigh, N. C.," will receive attention.

The Station conducts a large correspondence with farmers and others concerning agricultural matters. It is always glad to receive and to answer questions.

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 any line 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, Metallurgy, Chemistry, Dyeing, Textile Industry, and Architecture. It also offers practical training in Carpentry, Wood-turning, Blacksmithing, Machinery-work, Mill-work, Boiler-tending, Engine-tending, Dynamo-tending, and Road-building.

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, History, Political Economy, Physics, Chemistry, Botany, Zoology, 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 fibre; nor for those that are unable or unwilling to observe regularity, system, and order in their daily work.

MANUAL TRAINING.

Such special students as desire, may employ their whole time in manual training. The carpenter shop, the wood-turning shop, the blacksmith shop, the machine shop, the drawing and designing-rooms, the barns, dairies, fields, and green-houses afford facilities wherein young men not desiring a four year course or not able to take it may obtain very useful training and very profitable skill. Young men desiring to be mechanics, machinists, electricians, engine-tenders, boiler-tenders, or dynamo-tenders, may find very profitable instruction at the College.

PRIZES.

A first prize of ten dollars and a second prize of five dollars are awarded annually to the student in the Freshman Class who earns the largest and the next largest amount of money by agricultural labor on the College farm.

Mr. A. L. Chamberlain offers a prize of \$5 to the student who shall keep the best account of his college expenses during the year.

Mr. A. L. Chamberlain offers a prize of \$5 to the student who shall spend the least amount of money during the college year, exclusive of board, tuition, and fees.

The Arthur H. Thomas Company of Philadelphia offers to the Biological Club as first and second prizes two "Aplanatic Triplet" hand magnifiers to be awarded for the most deserving work in biology.

The Vermont Farm Machine Company offers a prize of their No. 7 United States Separator for the student doing the best all-round work in dairying.

P. M. Sharples, West Chester, Pa., offers a Butter Cup Separator to the student standing high in dairy work, and presenting the best paper on Dairying in North Carolina.

The Zenner Disinfectant Company offers a silver medal for the best report of the live stock exhibit at the State Fair.

The D. M. Osborne Company, Charlotte, N. C., gives a prize of an Osborne Mower to the student preparing the best essay on the "Place of Farm Machinery in North Carolina Agriculture."

DISCIPLINE.

The College is under military discipline and the students are regularly organized into a battalion. A printed copy of rules and regulations is furnished each student on admission, and he is expected to conform to the same during his connection with the institution. The discipline is intended to secure studious and economical habits, with punctuality, system, and order in the performance of all duties. A durable uniform, which is required to be worn on all occasions, prevents extravagance and folly in dress; rooms plainly furnished and a mess-hall economically managed by the College prevent extravagance in living; regular study hours, day and night, with proper restrictions as to visiting Raleigh, check, or at least minimize, tendencies to idleness, vice, and rowdiness.

Regular reports of scholarship and conduct are made to parents and guardians three times a year. Special reports are made whenever necessary. Students who are persistently neglectful of duty, or mani-

festly 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 or to the College. Every effort is made to develop strong, intelligent, high-toned men; and proper patience, forbearance, and sympathy are used in this great work; but the College is in no sense a reform-school, and its work must not be hindered by the presence of young men who are grossly and inherently vicious, idle or incompetent.

LIBRARY AND READING-ROOMS.

The College Library and Reading-rooms are on the second story of the Main Building. The reading-rooms are supplied regularly with about one hundred and twenty-five magazines and journals of various kinds, and yearly additions are being made to this number. The library contains about thirty-five hundred volumes. There are also reference libraries in the different departments. The library and reading-rooms are kept open from 8 A. M. to 6 P. M. The Librarian is always present to assist students in finding desired information.

LIBRARY FACILITIES.

The Olivia Raney Library in Raleigh, containing now about seven thousand volumes, is free to the students and they have the privilege of borrowing books from it. Students also have the privilege of consulting 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 the formation of good character, the development of manly physical vigor, and the promotion of literary, scientific, and technical research and training.

The Young Men's Christian Association, containing in its membership representatives of all the Christian denominations, meets regularly for conference, study, and worship, and exerts a wholesome influence throughout the College.

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

The Dramatic Club presents at least one play each year to the theatre-going people of Raleigh. The plays selected are high-classed, offering full opportunities for artistic and clever acting. Sheridan's "The Rivals" (this year's performance), was a most successful and artistic performance.

The Athletic Association is intended to promote physical health and manly spirit through athletic sports. Under the direction of the Athletic Committee of the Faculty, it promotes practice in base-ball, foot-ball, etc. The College is provided with extensive grounds, which furnish ample facilities for military drill and athletic sports.

The Biological Club meets semi-monthly 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.

The Liebig Chemical Society meets fortnightly for the discussion of chemical subjects and for review of the current chemical literature with which the College is well supplied.

Electrical Engineering Society.—The members of the Society meet once a week in the physical laboratory. The work done consists in a review of current literature of electrical engineering. The Society has at its disposal the best periodicals, most of which are furnished free of charge by the publishers.

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

The Rural Science Club meets semi-monthly 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.

Secret Societies, Greek letter fraternities and like organizations are not thought to be for the best interests of the College, and are not permitted.

The Alumni Association meets on Monday of each year preceding Commencement day, transacts its annual business, hears the Alumni oration and attends the annual Alumni banquet. This Association has established a Student Aid Fund to assist needy students in obtaining their education at the College by making them small loans.

REQUISITES FOR ADMISSION.

Applicants for admission must be at least sixteen years of age and must bring certificates of good moral character from the school last attended.

To the Four Year Courses.—Applicants for admission to the Freshman Class of all four year courses will be examined on the following subjects: Arithmetic (complete), Algebra (through simple equations), English Grammar, Analysis and Composition, and American History. No student will be admitted to the Freshman Class whose examination papers are seriously faulty in spelling, grammar, punctuation or division into paragraphs.

To the Two Year Courses.—Applicants for admission to the two year courses in Textile Industry and in Dyeing will take the same examinations as those required of candidates for admission to the Freshman Class. Applicants for admission to the two year courses in Agriculture and in Mechanic Arts will be examined on Arithmetic (through decimal fractions), English Grammar and Composition, and American History.

Applicants for admission to the two year courses in Agriculture and Mechanic Arts, if they are twenty years of age, will not be required to take the entrance examinations.

To the Special Courses.—No entrance examination is required of candidates for admission to the Special Courses. No one under eighteen years of age will be admitted to a special course.

TIME OF EXAMINATIONS.

Entrance examinations will be held by the County Superintendents of Instruction in each court-house in the State at 10 o'clock A. M. the second Thursday in July of each year. The date for 1902 is July 10th. These examinations will save the expense of a trip to Raleigh in case the candidate should fail, or if there should not be room enough for him in the College. Entrance examinations will be held also at the College on the first Wednesday in September of each year. The date for 1902 is September 3d, 9 o'clock A. M.

ADMISSION WITHOUT EXAMINATION.

The following persons will be admitted without examination:

1. Applicants for admission to Special Courses over eighteen years of age.
2. Applicants for admission to the two year courses in Agriculture and Mechanic Arts if they are over twenty years of age.

3. School-teachers holding teachers' certificates.
4. Graduates of those High Schools and Academies whose certificates are accepted by the Faculty of this College.

SESSION.

The College session lasts nine months, and opens annually the first Wednesday in September and closes the last Wednesday in May, with a vacation of about ten days at Christmas.

EXPENSES.

The annual expenses are as follows:

Tuition, \$20; Lodging, \$10; Fuel and Lights, \$12.50; Furniture, \$2; Library, \$1; Incidental, \$1; Medical Fee and Medicine, \$4.50; Board, \$72; total, \$123. Payments are made monthly in advance. A fee of \$1 is charged all students reporting for registration after the regular day appointed for that purpose—said fee being placed to the credit of the student loan fund.

Students in the four year courses taking shop-work are required to pay a fee of \$1 at the beginning of each year for material and the use of tools. A similar fee of \$1 is collected from four year course students taking drawing. Students in the two year courses in Mechanic Arts and in the Special Courses in Shop-work and Drawing pay a fee of \$1.50 instead of \$1.

Students in the chemical laboratory are required to make a deposit at the beginning of the year, to cover breakages, as follows: Sophomores and Juniors, \$2.50; Seniors, \$5; any unused portion of this will be returned at the end of the year.

Textile students will make a deposit of \$5 at the beginning of the year, to cover cost of designing supplies, tools, etc., any unused portion of which will be returned at the end of the year.

There is no deduction for less time than one month, except for board. The College uniform costs, including cap, about \$13.85, the uniform overcoat \$10 to \$13, one pair overshoes 75 cents to \$1, and must be paid for when received. A cheap set of overalls should be purchased for shop and field-work. *Each student must supply four sheets, two pillow-cases, four towels and two counterpanes, which he can bring from home, and must purchase his own books, stationery, drawing instruments and materials, which he can obtain at the College.* Students who are willing to work may reduce their total annual expenses to one hundred dollars.

UNIFORM.

The College uniform must be worn by all students excepting special students in Agriculture and Mechanic Arts. It must be purchased at the College from the contractor. The uniform is of a strong gray cloth, and with care it will last a year. New students are especially cautioned not to bring with them to the College a supply of citizens' clothing, as the uniform must be worn on all occasions.

FREE TUITION.

Scholarships, conferring free tuition and lodging, are given to needy boys 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. A scholarship once bestowed will be retained by the holder until graduation, unless he should prove neglectful of his studies or guilty of serious misconduct.

One hundred and twenty-five scholarships have been established by the Board of Agriculture for students in the four year and two year courses in Agriculture. These scholarships cover tuition, and are available for the time the student is in college. They also cover room rent if the College dormitories are not otherwise occupied.

SELF-HELP.

Many students pay their own expenses, either wholly or partly, by doing various kinds of work. There is regular employment for a limited number, enabling them to earn from \$4 to \$10 a month. There is also occasional employment, paying from \$2.50 to \$5 a month. New students should not rely upon securing employment the first four months. Except when arrangements have been previously made with the College authorities, young men in needy circumstances are not advised to come to the College, unless during the year they can have at their command at least one hundred dollars.

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 six per cent., and good security is required. Sufficient

time is given for repayment 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 about three hundred dollars.

BOARD AND LODGING.

All students are expected to board in the College mess-hall and room in the College dormitories. An abundant supply of plain, nourishing food, with as large variety as possible, is furnished absolutely at cost. The charge at present is \$8 per month, payable in advance, with reduction in case of withdrawal during the month.

Rooms in the College dormitories are supplied with electric lights, steam heat and all necessary furniture, except sheets, pillow-cases, bed-spreads 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. Lodging in the College buildings will not be supplied to special students, who are permitted, however, to board in the mess-hall, if they so desire.

Any student over twenty-one years of age is permitted to room and board outside the College.

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, at frequent intervals, are made by the College physician. There is an abundant supply of pure water from twelve deep wells. Each cadet 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 10 o'clock, and in cases of serious illness, as frequently as may be required.

COURSES OF INSTRUCTION.

The College offers the following Courses of Instruction :

I. Full Courses of four years, leading to degrees in :

- 1st. **Agriculture** (including Agriculture, Horticulture, Veterinary Science, Biology, and Agricultural Chemistry).
- 2d. **Engineering** (including Civil Engineering, Mechanical Engineering, Electrical Engineering, and Mining Engineering).
- 3d. **Chemistry** (including Metallurgy and Dyeing).
- 4th. **Textile Industry** or Cotton Manufacturing.

These courses offer a combination of practical and theoretical work, about half of the time being devoted to lectures and recitations and the other half to work in the shops, laboratories, drawing-rooms, green-houses, dairies, fields, and mills. They are intended to furnish both technical and liberal education. The Bachelor's degree is conferred upon any one who completes a Full Course.

II. Short Courses of two years (not leading to a degree) in Agriculture, in Textile Industry, in the Mechanic Arts (including Carpentry, Wood-turning, Blacksmithing, Machinist's Work and Drawing), in Dyeing, and in Building and Contracting.

The Short Courses include nearly all the practical work of the Full Courses, with less theoretical instruction. They are intended for students who desire chiefly manual training or for those who are unable to complete the Full Courses.

III. Special Courses, requiring about three months, in Agriculture, Carpenter-work, Machine Shops, Engine-tending, Boiler-tending, Machine Drawing, Designing, and Road-building. The special courses are intended for persons of limited means, or limited opportunity, who desire special training in a single line.

IV. Graduate Courses, extending over two years and leading to advanced degrees. These are intended for students who have completed the Full Courses and who desire further instruction and training along special lines.

AGRICULTURAL COURSES.

I. The Four Year Course in Agriculture.

Ia. The Two Year Course in Agriculture.

Ib. The Winter Course in Agriculture and Dairying.

Aim and Scope.—The aim of the Agricultural Courses is to train young men in both the science and the practice of their profession. 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 four distinct courses:

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 domains of science, the course is essentially scientific rather than literary. Yet the College is mindful of the fundamental character of English Literature and of Political Economy as training studies, and reasonable attention to these studies is required.

The two year course is designed to meet the needs of those who are unable to take the longer course. It is especially devoted to the practical study of Agriculture and Horticulture, and their various branches, and the natural sciences which are so closely related to farming.

The ten 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 ten weeks' dairy course is a course in practical butter-making in accordance with the most approved methods of the modern creamery.

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

The equipment for the technical work of the course is rapidly increasing. The Department of Agriculture is fitting up laboratories for investigation in Soil Physics and in the mechanical analysis of soils. 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 upon yield and upon fertility, in varieties of fruit, of vegetables, and of forage crops. The methods employed and the results obtained are freely used for instruction.

In work other than purely technical the agricultural students meet the same instructors and enjoy the same privileges as other students of the College. In all departments the laboratory method is freely employed. The student uses apparatus with his own hands and consults the literature of the subject at every step.

Scholarships in Agriculture.—One hundred and twenty scholarships have been established by the Board of Agriculture for students in the four year and the two year courses in Agriculture. These scholarships cover tuition (and room rent in the College dormitories if the College can furnish rooms), and are available for the time the student is in college.

Self-support while a Student.—The Board of Agriculture, in the interest of young men who are unable to meet necessary college expenses, has appropriated \$2,000 annually for student labor. This generosity on the part of the Board enables every student to pay a good part of his college expenses; some are able to meet the entire expense this way. This sum appropriated is intended solely to pay for farm work. The work is precisely the sort of work that is done on the farm—plowing, hauling, tile-laying, feeding beef cattle, feeding dairy cattle, feeding and grooming horses, running ditches and terraces, repairing machinery and tools, harvesting crops, the care of hogs, poultry, etc.

This feature in the courses of agriculture is helpful not only in defraying college expenses, but serves as a training and education as well.

Requisites for Admission.—Applicants for admission to the four year course in Agriculture must be at least sixteen years of age, and are examined in the following subjects: Arithmetic (complete), Algebra (through simple equations), English Grammar, and American History.

For the two year course in Agriculture no entrance examinations are required if the applicant is at least twenty years old. Applicants not twenty years old desiring to enter the two year course will stand an examination in Arithmetic (through decimal fractions), English Grammar and Composition, and American History.

For the winter courses in Agriculture and Dairying no entrance examination is required, but applicants must be over eighteen years of age.

I. Four Year Course in Agriculture, leading to the Degree of Bachelor of Agriculture.

Freshman Year.

SUBJECTS.	PERIODS PER WEEK.*		
	1st Term.	2d Term.	3d Term.
Botany, Elementary, 28†-----	3	3	--
“ Systematic, 29-----	--	--	3
Zoology, 35-----	3	--	3
“ (Entomology), 37-----	--	3	--
Elementary Horticulture, 23-----	4	--	--
Pomology, 24-----	--	--	4
Dairying, 14-----	--	4	--
Algebra, 55-----	4	4	--
Geometry, 56-----	--	--	4
English, 58-----	3	3	3
Military Drill, 65-----	8	3	3

†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.

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

Sophomore Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Breeds of Live Stock and Stock-judging, 1	3	--	--
Principles of Breeding and Stock-judging, 2	--	3	--
Stock-feeding, 3	--	--	3
Plant Diseases, 30	3	--	--
Human Physiology, 36	--	3	--
Physiological Botany, 31	--	--	3
Inorganic Chemistry, 39	3	3	3
Inorganic Chemistry (laboratory), 40	2	2	2
Physics, 47	2	2	2
Free-hand Drawing, 48	2	--	--
Mechanical and Agricultural Drawing, 49	--	2	2
English, 59 and 61	2	2	2
Military Drill, 65	3	3	3

Junior Year.

Farm Equipment, 4	4	--	--
Soils, 5	--	4	--
Farm Crops, 6	--	--	4
Veterinary Anatomy, 19	4	--	--
Veterinary Medicine, 20	--	4	--
Veterinary Practice, 21	--	--	4
Agricultural Chemistry, 45	2	2	2
Analytical Chemistry (laboratory), 43	2	2	2
Wood-work, 50	1	1	--
Forge-work, 51	1	1	--
Mechanical Technology, 52	1	1	--
Farm Machinery, 7	--	--	3
English and History, 62 and 63	2	2	2
Military Tactics, 66	1	1	1
Military Drill, 65	3	3	3

Senior Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
History of Agriculture, 18.....	--	--	3
Bacteriology, 33.....	3	3	--
English, 60 and 62.....	2	2	2
Political Economy, 64.....	2	2	2
Military Drill, 65.....	3	3	3
Elect ten hours of the following:			
Animal Husbandry (horses), 8.....	2	--	--
Animal Husbandry (cattle), 9.....	--	2	--
Animal Husbandry (sheep and swine), 10.....	--	--	2
Agronomy, 11.....	3	--	--
Special Crops, 12.....	--	3	--
Soil Physics and Soil Management, 13.....	--	--	3
Dairy Bacteriology, 15.....	3	--	--
Experimental Dairying, 16.....	--	3	--
Dairy Seminary, 17.....	--	--	3
Veterinary Medicine, 22.....	3	3	3
Market Gardening, 25.....	3	--	--
Forestry, 26.....	--	3	--
Landscape Gardening, 27.....	--	--	3
Plant Diseases (advanced), 34.....	2	--	--
Entomology (advanced), 38.....	--	2	--
Economic Botany, 32.....	--	--	2
Organic Chemistry, 41.....	2	2	2
Analytical Methods, 42.....	1	1	1
Agricultural Chemical Analysis (lab'y), 44.....	4	4	4

Ia. The Two Year Course in Agriculture.

First Year.

Botany, Elementary, 28.....	3	3	--
" Systematic, 29.....	--	--	3
Elementary Horticulture, 23.....	4	--	--
Pomology, 24.....	--	--	4
Dairying, 14.....	--	4	--
Elementary Agricultural Chemistry, 46.....	2	2	2
Arithmetic, 53.....	5	--	--
Algebra, 54.....	--	5	5
English, 57.....	3	3	3
Military Drill, 65.....	3	3	3

Second Year.

Elect seventeen hours from the following :

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Breeds of Live Stock and Stock-judging, 1	3	--	--
Principles of Breeding and Stock-judging, 2	--	3	--
Stock-feeding, 3	--	--	3
Farm Equipment, 4	4	--	--
Soils, 5	--	4	--
Farm Crops, 6	--	--	4
Veterinary Anatomy, 19	4	--	--
Veterinary Medicine, 20	--	4	--
Veterinary Practice, 21	--	--	4
Market Gardening, 25	3	--	--
Forestry, 26	--	3	--
Landscape Gardening, 27	--	--	3
Plant Diseases, 30	3	--	--
Human Physiology, 36	--	3	--
Physiological Botany, 31	--	--	3
Zoology, 35	3	--	3
Zoology (Entomology), 37	--	3	--
Inorganic Chemistry, 39	3	3	3
Inorganic Chemistry (laboratory), 40	2	2	2
Wood-work, 50	1	1	--
Forge-work, 51	1	1	--
Mechanical Technology, 52	1	1	--
Farm Machinery, 7	--	--	3
Military Drill, 65	3	3	3

WINTER COURSES IN AGRICULTURE AND DAIRYING.

General Statement.—The Winter Course in Dairying and the Winter Course in Agriculture are designed to meet the wants of young men who are ambitious to excel in their chosen vocation of farming and who feel the need of more and better preparation before taking up their life work. The subjects presented in the two courses are those about which every young farmer should have definite and clear knowledge. In their treatment the topics are handled in such a way as to make the information to the student useful in the highest possible degree.

There is no longer any question concerning the value of advanced, definite knowledge concerning agriculture to those who follow farming; education and training pay on the farm as they do elsewhere in life.

The expenses of the course are so little, and the good to be derived so great, no young man in North Carolina can afford to miss the opportunity of getting this training so necessary in his work. The money necessary to meet the expenses for a whole term's instruction can be earned in a month or two before attending. Therefore no young man, even though he possesses but a few dollars, can afford to miss the opportunity for training in his work.

The studies offered are dairying, stock-raising, creamery practice, stock-feeding, diseases of farm animals, dairy-farming, breeding farm animals, entomology, dairy chemistry, farm economics, and book-keeping. The class-room work is supplemented by practice in the creamery, barn, greenhouse, and work shop.

Equipment.—The work in dairying which includes butter-making, milk-testing, handling cream separators, pasteurizing cream and milk, and dairy bacteriology, is given in the Dairy building. The building is equipped with separators, milk-testers, pasteurizer, and all tools required in making butter and preparing milk or cream for the city markets.

Requirements for Admission.—No entrance examination is required, but the students taking either the Dairy or Winter Course must be at least eighteen years of age and should have a common school education.

Expenses—College Dues.—Each student is required to pay a laboratory fee of five dollars. Tuition and instruction are entirely free.

Other Expenses.—Books and note-paper will cost from two to three dollars, and two white duck suits to wear in the dairy laboratory will cost one dollar each. The suits however are not required. Board and room may be secured for \$2.50 per week. The total expenses of the whole ten weeks need not exceed thirty dollars.

Ib. The Winter Course in Agriculture and Dairying.

Butter-making.—This course includes all practical operations of creamery management. The student works with the guidance and under the direction of the Instructor at the same operations of butter-making, or pasteurizing, or milk-testing until proficiency is obtained. He is required to follow the milk from the time it enters the laboratory and creamery until the product leaves it, and to determine the points in processes where losses occur and reasons why they occur. Six periods. Mr. KENDALL.

Milk and Butter Production.—This course consists of lectures and recitations on the methods of taking care of milk and the manu-

facturing of it into other products. Also lectures upon construction, equipment and operation of creameries, dairies and milk depots. Each student is required to draw a plan of a farm dairy and prepare an estimate for equipment of same. Two periods. Professor BURKETT and Mr. KENDALL.

Farm Chemistry.—The course is planned to give the student a brief outline of the composition of the soil, composts, and fertilizers in their relation to plant growth; the composition of the plant and the changes brought about in various methods of curing; the composition of milk and its products, etc. The lectures will be illustrated as far as practicable by experiments. Two periods. Professor WITHERS.

Dairy Farming.—Lectures are given under this subject upon the history, adaption, care, and management of the different breeds of dairy cattle. Dairy animals are studied by the score card, in accordance with the practice of judging animals for dairy purposes.

Instruction will also be given upon the character of food-stuffs, the relation of food to the animal, and kind and quality of food for the best milk production. Two periods. Professor BURKETT.

Bacteriology.—The course in bacteriology will consist of lectures and laboratory work, treating of the economy of bacteria in farm operation, their work in the manufacture of butter and cheese, and in the manufacture of manures, wines, vinegar, etc. Special consideration is given to the diseases of butter and milk.

Practical instruction will be given in sterilizing and pasteurizing cream and milk, also in making use of cultures or "starters" for ripening cream. Two periods. Dr. STEVENS.

Winter Gardening.—This course covers the growing, handling and marketing of crops suitable for winter forcing under glass. The College greenhouse will be used for practical demonstration. Besides forcing of vegetables, greenhouse construction, types and forms of houses, different methods of heating, cost of forcing houses, soils, fertilizers, composts, subirrigation, ventilation and shading, forcing crops by the use of electric light, pollination, as well as combating insects and diseases, will be taught and illustrated as far as practicable. Two periods. Mr. RHODES.

Disease of Cattle.—The lectures of this subject consist of the anatomy of the cow, with special reference to digestion, reproduction and milk producing organs, and the more common non-infective diseases and their treatment. Four periods. Professor BUTLER.

Entomology.—This is a short course in which the more important 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. Mr. SHERMAN.

Feeds and Feeding and Stock-raising.—This subject consists of an elementary study of the composition of foods; the constituents of feeding, amount, combination and form necessary to give best results with various kinds of live stock.

The student is required to calculate digestibilities and nutritive ratios and to arrange therefrom proper feeding rations. Two periods. Professor BURKETT.

Book-keeping.—This subject consists of the practical study of farm accounts, supplemented by numerous original examples and sets of practice. One period. Professor HILL.

Farm Economics.—This is an elementary course, dealing with production, distribution, and exchange of wealth. The leading topics discussed are capital, wages, money, transportation, and taxation. One period. President WINSTON.

AGRICULTURE.

Equipment.

The College possesses the following equipment for instruction in Agriculture: The farm includes six hundred acres, with one hundred and fifty acres under cultivation; a large basement barn, 50 by 72 feet, three stories. The first floor is occupied by farm implements and machinery; second story is occupied by horses, grain bins, cutting implements, etc.; third story, by hay, which is elevated by a Ricker and Montgomery hay carrier. Just outside the barn are two 70-ton silos. These are connected with a No. 18 Ohio feed and ensilage cutter. Power for cutting is supplied by an eight-horse power Skinner engine. The farm is supplied with all necessary machinery for the most successful and up-to-date farming.

The Dairy Building contains three rooms and cellar, and is supplied with DeLaval, Sharpless, United States, and Reid Separators, Babcock Testers, various kinds and makes of churns, butter-workers, etc.

The live stock consists of necessary horses and mules, a herd of dairy cattle, also a herd of twenty young Aberdeen-Angus beef cattle. Poland-China and Berkshire swine are bred pure, and from high-class specimens, from which breeding-stock is sold as a part of the farm products.

The Poultry-yard is divided into sixteen lots. The buildings consist of incubator cellar, brooder-house, and hen-houses. Several different incubators are used. The Poultry-yards contain the following breeds: White Wyandotte, White and Barred Plymouth Rock, Black Minorca, Brown Leghorn, Light Brahmas, and Pekin Ducks.

Subjects of Instruction.

1. Breeds of Live Stock.—Lectures and recitations upon the history, characteristics, care and management, and adaption of the different breeds of live stock. Practical exercises are given in scoring and judging the various kinds of live stock with the score card. Three periods, first term. For Sophomores and second-year students. PROFESSOR BURKETT.

2. Principles of Breeding.—Lectures and recitations upon the laws of inheritance, and the principles and phenomena of evolution as applicable to the improvement of animals or plants. The aim is to bring every known principle of reproduction to the assistance of the breeder's art.

Practical exercise in scoring and judging live stock, and in writing and tracing pedigrees. Three periods, second term. For Sophomores and second-year students. PROFESSOR BURKETT.

3. Stock-feeding and Hygiene.—Lectures and exercises upon the laws of nutrition, and the character of food-stuffs, and the kind and quality of foods to produce certain results. Practical exercises in calculating digestibility, nutritive ratios, and feeding standards. Three periods, third term. For Sophomores and second-year students. PROFESSOR BURKETT.

4. Farm Equipment.—Lectures and recitations upon selecting, planning, and equipping farms; planning and erecting farm buildings; farm vehicles and machinery; power, water, and drainage; practical exercise in drawing plans of farms and farm buildings; levelling and laying drains, dynamometer tests of wagons and farm implements, etc. Four hours first term. For Juniors and second-year students. PROFESSOR BURKETT.

5. Soils.—Lectures and recitations upon composition, formation, kinds, and physical properties of soils and their improvement by cultivation, natural and artificial fertilizers, drainage and irrigation. Practical exercises in testing physical properties of several soils, determining the relation of soils to heat, moisture, air, and fertilizers, and mechanical analysis. Four hours, second term. For Juniors and second-year students. PROFESSOR BURKETT.

6. Farm Crops.—Lectures and recitations upon the history, production, harvesting, and marketing of farm crops. Practical exercise with growing and dried specimens of farm crops, including grasses, clovers, and other forage crops. Four hours, third term. For Juniors and second-year students. Professor BURKETT.

7. Farm Machinery.—Lectures and laboratory work on the tools and machinery of the farm, in reference to their design, construction, draft, durability, and care. The student is required to set up and test the various machines used on the farm. Three hours, third term. For Juniors and second-year students. Professor BURKETT.

8. Animal Husbandry.—A critical study of the horse; his breeding and management; gaits; practice in expert judging of horses. Two periods, first term. For Seniors. Professor BURKETT.

9. Animal Husbandry.—A critical study of beef and dairy cattle; the breeding, feeding, and management, and practice in expert judging of cattle. Two periods, second term. For Seniors. Professor BURKETT.

10. Animal Husbandry.—A critical study of sheep and swine in reference to type, wool or mutton; pork or bacon. The breeding, feeding, and management of sheep and swine, and practical exercise in expert judging sheep and swine. Two periods, third term. For Seniors. Professor BURKETT.

11. Agronomy.—A critical study of the farm crops, corn and cotton; judging of corn; conditions of germination and growth, and improvement by selection and breeding. Three periods, first term. For Seniors. Professor BURKETT.

12. Special Crops.—Special crops will be studied by the student in the laboratory and field. Three periods, second term. For Seniors. Professor BURKETT.

13. Soil Physics and Management.—This course is designed for advanced work in the study of soils, both in the laboratory and the field. Three periods, third term. For Seniors. Professor BURKETT.

14. Dairying.—Practice and occasional lectures. The course consists in general management of modern dairying, the methods of milk analysis, the bacteriology of milk, the use of separators, the testing of milk, ripening of cream, churning, working, packing and scoring butter. Four periods, second term. For Freshmen. Professor BURKETT and Mr. KENDALL.

15. Dairy Bacteriology.—A laboratory course in the study of bacteria in its relation to creamery, butter-making, and cheese production. Three periods. For Seniors. Mr. KENDALL.

16. Experimental Dairying.—Laboratory practice in making butter and cheese. Three periods. For Seniors. Mr. KENDALL.

17. Dairy Seminary.—Laboratory practice in making butter and cheese of special commercial importance. Three periods. For Seniors. Mr. KENDALL.

18. History of Agriculture and Rural Economics.—Lectures upon the history of Agriculture; present agricultural methods in various counties; cost and relation, profits of various farm operators and systems. Three hours, third term. For Seniors. Professor BURKETT.

VETERINARY SCIENCE.

The object of the teaching in this department is not to turn out educated veterinarians, but it is intended to more thoroughly equip the agricultural student for the breeding and management of live stock. In addition to the work required of all students in the Agricultural courses, as outlined below, the Senior students in the four year course in Agriculture may elect to do three hours a week during the entire year. When so elected, this work will be of a more advanced nature, but supplementary to that required of all students in the Agricultural courses.

19. Veterinary Anatomy.—Lectures, illustrated by charts and sketches and, when practicable, by dissections.

Special attention will be given to the organs of digestion and locomotion and such other parts as are of particular interest to the stock farmer. Four periods, first term. Required of Juniors and elective for second-year students in the two-year course. Professor BUTLER.

20. 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. Four periods, second term. Required of Juniors and elective for second-year students in the two year course. Professor BUTLER.

21. Veterinary Practice.—Lectures on the most common diseases and injuries of domestical animals, with appropriate treatment for the same. When practicable these lectures will be illustrated by clinics, which will enable the student to become more familiar with the different diseases and to perform minor surgical operations under the direction of the instructor. Four periods, third term. Required of Juniors and elective for second-year students in the two year course. Professor BUTLER.

22. Veterinary Medicine.—Advanced course in the use and action of reviewing medicines with chemical practice. Three periods. For Seniors. Professor BUTLER.

HORTICULTURE.**Equipment.**

Twenty-three acres of land comprise the Horticultural Experiment farm. There is ample equipment of barns, silos, stock, and machinery. There are five communicating greenhouses, separated by glass partitions so that different night temperatures can be maintained to suit the various purposes to which the houses are devoted. In addition, there is one glass structure, without heat, for the culture of foreign grapes. There is kept a general collection of plants for botanical study and for practice in Floriculture, and in two of the houses winter forcing of vegetables and fruits is carried on, in order that the students may have practice in a line of work that is rapidly assuming commercial importance in the State. The building and greenhouses are heated in the most complete manner by hot water.

The entire basement of Primrose Hall is used as a Horticultural Laboratory, where practice in grafting, potting, and cross fertilization of plants is constantly going on.

Subjects of Instruction.

23. Elementary Horticulture.—Massey's *Trucking in the South*. Four periods, first and third terms. Required of Freshmen and first-year students. Mr. RHODES.

24. Pomology.—Bailey's *Principles of Fruit Growing*. Four periods, third term. Required of Freshmen and first-year students. Mr. RHODES.

25. Market Gardening.—Lectures on the theory and practice of growing vegetables in open ground and under glass commercially. Three periods, first term. Elective for Seniors and second-year students. Professor MASSEY.

26. Forestry.—Lectures on forest influences and methods of forest management, timbers, and forest products. Three periods, second term. Elective for Seniors and second-year students. Professor MASSEY.

27. Landscape Gardening.—Lectures on the history of the garden art and styles of ornamental gardening, planning of country places and farm-houses, and improvement of grounds in general. Professor MASSEY.

BIOLOGY.**Equipment.**

The biological laboratory is equipped with the books, specimens, sterilizers, microscopes, microtomes, and the small utensils needed in the prosecution of the work. The excellent herbarium has been mounted and is now accessible for class use. There is an extensive collection of seeds of both weeds and cultivated plants, and most of the important plant diseases are represented by herbarium and alcoholic specimens. The greenhouse is of great utility as a source of material in seed-testing and for conducting physiological experiments.

Subjects of Instruction.

28. Elementary Botany.—Weekly lectures accompanied by laboratory work and reference-reading regarding the algae, fungi, ferns, and seed plants. Morphology is emphasized and the broad principles of nutrition, reproduction, 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 field-work and independent investigation. Three periods, first and second terms. Required of Freshmen and first-year class in Agriculture. Doctor STEVENS.

29. Systematic Botany and Ecology.—The student becomes acquainted with the principal orders and families of plants of North Carolina as well as with the general problems of plant classification. More attention is given to the grouping of plants into societies and to the study of plant variation and adoption than to mere collecting and classifying. Three periods, third term. Required of Freshmen and first-year class in Agriculture. Doctor STEVENS.

30. Plant Diseases.—Lectures and laboratory study of the principal types of plant diseases produced by bacteria, fungi or physiological derangement, with specific consideration of the methods of treatment. This course emphasizes the principles of plant disease and places the student in a position to employ prophylactic and remedial methods rationally. Three periods, first term. Required of Sophomores and second-year class in Agriculture. Doctor STEVENS

31. Physiological Botany.—Lectures, demonstrations and laboratory work treating of plant nutrition, reproduction, and growth. Especial attention is given to phases of the subject bearing most directly upon plant culture. Three hours, third term. Required of Sophomore and second-year class in Agriculture. Doctor STEVENS.

32. Economic Botany.—A study of the more important groups of economic plants, grasses, and forage plants, weeds, medicinal plants, fibres, and of seed-testing, nitrification, origin of cultivated plants, etc. Two hours, third term. Required of Seniors in Agriculture. Dr. STEVENS.

33. Bacteriology.—Lectures and laboratory work on the nature, physiology, morphology, and economy of bacteria, with especial reference to home sanitation, disinfection and to the relation of bacteria to disease in plants and animals. The student becomes familiar in the laboratory with methods of culture and investigation in bacteriology. Three hours, first and second terms. Required of Seniors in Agriculture. Doctor STEVENS.

34. Plant Disease (Advanced).—Methods of culture and investigation of Plant Disease. This course is intended to prepare the student for original investigation in plant diseases. Two hours, first term. Elective for Seniors in Agriculture. Doctor STEVENS.

35. Zoology.—The more fundamental principles of animal life, together with a knowledge of the structure and classification of animals, are developed by lecture, laboratory work, and reading. Two terms are devoted to vertebrates and invertebrates exclusive of insects. This course is intended to present a general view of the animal kingdom and to lay a foundation for the more special subjects that are to follow. Three periods, first and third terms. Required of Freshmen and second-year students in Agriculture. Doctor STEVENS.

36. Human Physiology.—Lectures and laboratory work, supplemented by home work and observation, cover the more important features of human physiology and hygiene. Three hours, second term. Required of Sophomore second-year class in Agriculture. Dr. STEVENS.

37. Entomology.—Elements of insect structure and classification. Injurious insects and remedies; *a.* Orchard insects; *b.* Insects 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. Three periods, second term. Required of Freshmen in Agriculture. Mr. SHERMAN.

38. Entomology (Advanced).—Systematic study of orders and families of insects with special reference to structure, classification, life histories, and habits. Lectures and laboratory practice. Two periods, second term. Required of Seniors in Agriculture. Mr. SHERMAN.

CHEMISTRY.*

39. Inorganic Chemistry.—Remsen's *Introduction to the Study 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 with experiments and the exhibition of specimens. Three periods. Required of Sophomores. Professor WITHERS and Doctor FRAPS.

40. Inorganic Chemistry.—Laboratory work. Remsen and Randall's *Laboratory Guide*. The student performs under the eye of the instructor experiments designed to illustrate and emphasize the work of the class-room. He records in a note-book his observations and the conclusions drawn from them. Two periods. Required of Sophomores. Mr. SYME.

41. 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. Two periods. Elective for Seniors. Mr. BIZZELL.

42. Analytical Methods.—A discussion of methods and principles involved in qualitative and quantitative analysis. One period. Elective for Seniors. Professor WITHERS.

43. Analytical Chemistry (Introductory).—Laboratory work. Caldwell's *Chemical Analysis*. The student is taught to detect the presence of the more common elements in unknown substances. He is then given practice in introductory gravimetric and volumetric quantitative work. Two periods. Required of Juniors. Mr. SYME.

44. Agricultural Analysis.—Laboratory work. The work of the student in quantitative analysis is continued, embracing the analysis of those substances more closely related to his work, as fertilizers, feeding-stuffs, milk, butter, etc. Four periods. Elective for Seniors. Professor WITHERS and Mr. BIZZELL.

45. Agricultural Chemistry.—Attention is given to the consideration of the chemistry of soils and fertilizers; the preparation of manures and composts; the air as a plant-feeder; the constituents of the plant and their functions; the composition of feeding-stuffs; the principles of feeding animals; the composition of milk and butter; the making of soap, cider, vinegar, etc. Two periods. Required of Juniors. Professor WITHERS.

46. Agricultural Chemistry (Elementary.)—Two periods. Required of first-year students in the Short Course. Professor WITHERS.

* For further information see courses in Chemistry.

PHYSICS.*

47. 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 the study of light. Two periods. Required of Sophomores. Professor WEHRE.

DRAWING.†

48. Free-hand Drawing.—Work in the use of the pencil; isometric sketches; technical sketches of objects, usually parts of a machine. Two periods, first term. Required of Sophomores. Mr. CARTER.

49. Elementary Mechanical Drawing.—Use of instruments; geometric drawing; isometric drawing; elementary projections; drawings made to scale from working sketches of pieces of a machine. Two periods, second and third terms. Required of Sophomores. Mr. CARTER.

SHOP-WORK.‡

50. Wood-work.—Use of bench tools; working from drawings, lining, sawing, planing; practice in making simple exercises in wood; elementary exercises in wood-turning; handling wood lathes and tools. One period, first and second terms. Required of Juniors and second-year students in the two year course. Mr. CARTER.

51. Forge-work.—Exercises in forging and welding; making exercises of iron; care of forge tools and fires. One period, first and second terms. For Juniors and second-year students. Mr. OLIVER CARTER.

52. Mechanical Technology.—Classification and uses of wood-working and forging tools and machines; principles of correct methods of wood-working and forging; care of belting and shafting. One period, first and second terms. For Juniors and second-year students. Mr. CARTER.

MATHEMATICS.‡

53. Arithmetic.—Begin with decimal fractions and complete the subject. Five periods, first term. Milne's *Standard Arithmetic*. Required of first-year students. Mr. FISH and Mr. STURGILL.

*For full information in regard to the Department of Physics see course in Electrical Engineering.

†For full information in regard to shop-work, drawing, and other Mechanical Engineering subjects see course in Mechanical Engineering.

‡For full information in regard to Mathematics see course in Civil Engineering.

54. Algebra.—Up to quadratic equations. Wells's *Higher Algebra*. Five periods, second and third terms. Required of students in first year of short course. Mr. FISH and Mr. STURGILL.

55. Advanced Algebra.—Wells's *Higher Algebra*. Begin at quadratic equations; general theory of equations, solution of higher equations, etc. Four periods, first and second terms. Required of all Freshmen. Mr. YATES and Mr. FISH.

56. Geometry.—Plane and solid. Wentworth's *Plane and Solid Geometry*. Four periods, third term. Required of Freshmen. Mr. YATES.

ENGLISH.

57. English Composition.—A drill upon the forms of the language, the correct relation of words, the sentence, and its adjustment. Daily written exercises. Three periods. Required of first-year students. Mr. OWEN.

58. Introductory Rhetoric and Composition.—Scott & Denney's *Composition Rhetoric* and Buehler's *Exercises* are used as texts. These are accompanied by drills on the forms of the language and methods of sentence formation. The student is taught to plan all work, and every effort is made to develop his constructive faculties. Three periods a week. Required of Freshmen. Professor HILL and Mr. OWEN.

59. Rhetoric.—Newcomer's *Rhetoric*. The organic parts of discourse and the essential qualities of good style are considered. Especial study is given this year to themes in narration and description. Many exercises are required. Two periods, first and second terms. Required of Sophomores. Professor HILL.

60. Analysis and Construction of Themes in Exposition and Argumentation.—Two periods, third term. Required of Seniors. Professor HILL.

61. American Literature.—By means of an introductory text and by much reading students are introduced to what is best in the literature of their own country. Books are studied at first hand. Synopses, paraphrases, and critiques required. Two periods, third term. Required of Sophomores. Professor HILL.

62. English Literature.—The development of English Literature through its great periods and through its representative men. Much parallel reading is required. In a general way Minto's plan of study is followed. Two hours, third term. Required of Juniors. Two periods, first and second terms. Required of Seniors. Professor HILL.

HISTORY.

63. English History.—The text is supplemented by lectures on important periods. Two periods, first and second terms. Required of Juniors. Professor HILL.

POLITICAL ECONOMY.

64. Political Economy.—This course deals with public problems relating to the production, distribution, and exchange of wealth. The leading topics discussed are capital, wages, money, transportation, and taxation. Instruction is given by lectures and text-books. Required of Seniors. Two periods. President WINSTON.

MILITARY SCIENCE.

65. Drill.—Schools of the Soldier, Company, and Battalion in Close and Extended Order, Ceremonies; Marches and Minor Tactics. United States Infantry Drill Regulations. Three afternoons. Required of all classes. Commandant and officers of the Battalion.

66. Tactics.—Theoretical instruction in the Schools of the Soldier, Company, and Battalion in close and Extended Order; Ceremonies, etc. One period. Required of all Juniors. Captain PERLES.

ENGINEERING COURSES.

Four Year Courses in

- II. Civil Engineering,
- III. Mechanical Engineering,
- IV. Electrical Engineering,
- V. Mining Engineering.

Two Year Courses in

- IIa. Building and Contracting,
- IIIa. Mechanic Arts.

Special Courses in

- IIb. Road-building,
- IIIb. Carpentry,
- IIIc. Machine Shop,
- IIId. Engine and Boiler-tending,
- IIIe. Drawing.

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 drafting-room, and acquires a fair degree of efficiency in the use of the various surveying instruments, and in drafting. 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 Pure Mathematics and 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, yet subjects of general culture are included in order to give the student a broader mental training and better preparation for social and business life.

II. The Four Year Course in Civil Engineering, leading to the Degree of Bachelor of Engineering.

Freshman Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Free-hand Drawing, 91.....	2	--	--
Mechanical Drawing, 92.....	--	2	2
Wood-work, 96.....	1	1	1
Forge-work, 97.....	1	1	1
Mechanical Technology, 102.....	1	1	1
Algebra, 84.....	4	4	--
Geometry, 85.....	--	--	4
Book-keeping, 90.....	1	1	1
Elementary Physics, 112.....	2	2	2
English, 132.....	3	3	3
History, 138.....	2	2	2
Military Drill, 141.....	3	3	3

Sophomore Year.

Architecture, 80.....	2	--	--
Agricultural Drawing, 81.....	2	2	2
Geometry, 85.....	4	--	--
Trigonometry, 86.....	--	4	4
Descriptive Geometry, 71.....	--	2	2
Electricity and Magnetism, 113.....	2	2	2
Inorganic Chemistry, 127.....	3	3	3
Inorganic Chemistry (laboratory), 128.....	2	2	2
English, 133 and 135.....	2	2	2
Military Drill, 141.....	3	3	3

Junior Year.

Surveying, 68 and 69.....	2	2	2
Surveying (field-work), 70.....	2	2	2
Construction, 77.....	2	--	--
Mechanics, 89.....	3	3	3
Drawing, 71.....	2	2	2
Graphic Statics, 67.....	--	2	2
Analytical Geometry, 87.....	4	4	--
Calculus, 88.....	--	--	4
English and History, 139 and 136.....	2	2	2
Military Tactics, 142.....	1	1	1
Military Drill, 141.....	3	3	3

Senior Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
- Mechanics of Materials, 78	3	--	--
- Construction, 77	--	2	2
- Road-working, 79	--	1	1
+ Roofs and Bridges, 75	3	--	--
- Bridge Design, 72	--	3	3
- Municipal Engineering, 73	2	3	2
- Surveying (field-work), 74	3	3	3
- Hydraulics, 76	--	2	2
- Calculus, 88	2	--	--
- English, 136 and 134	2	2	2
- Political Economy, 140	2	2	2
- Military Drill, 141	3	3	3

IIa. The Two Year Course in Building and Contracting.

First Year.

Free-hand Drawing, 91	2	--	--
Mechanical Drawing, 92	--	2	--
Wood-work, 96	2	2	--
Mechanical Technology, 102	1	1	1
Architecture, 80	2	2	2
Arithmetic, 82	5	--	--
Algebra, 83	--	5	5
Geometry, 85	--	--	4
English, 131	3	3	3
History, 137	2	2	2
Military Drill, 141	3	3	3

Second Year.

Construction	2	2	2
Drawing	2	2	2
Contracts and Specifications	2	--	--
Estimates and Bills of Materials	--	2	2
Levelling and Use of Instruments	--	4	4
Algebra, 84	4	--	--
Geometry, 85	4	--	--
Trigonometry, 86	--	4	4
Book-keeping, 90	1	1	1
English, 132	3	3	3
Military Drill, 141	3	3	3

Iib. Special Course in Road-building (January to May).

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Surveying -----	--	1	4
Road-building (including the Survey and Location, Materials, Method of Construction, Drainage, Bridges, and Machinery) -----	--	6	6
Drawing -----	--	4	4
Trigonometry -----	--	4	4

CIVIL ENGINEERING.**Equipment.**

There is a complete equipment of all instruments necessary to civil engineering field-work.

Subjects of Instruction.

67. 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. Professor RIDDICK.

68. Surveying.—Land surveying, levelling, elements of triangulation, topographical surveying, road-making. Merriman's *Land Surveying*. Two periods, first term. Required of Juniors in Civil Engineering. Professor RIDDICK.

69. Railroad Engineering.—Reconnaissance, preliminary, and location surveys, cross-sections, etc. Searles' *Field Engineering*. Two periods, second and third terms. Required of Juniors in Civil Engineering. Professor RIDDICK.

70. Surveying.—Field-work. Use of instruments, compass, level, transit, and plane table. Practical work in land surveying, topography, levelling, railroad surveying, working up notes and platting. Two periods. Required of Juniors in Civil Engineering. Mr. FISH.

71. Drawing.—Descriptive Geometry, Stereotomy. Text-book, lectures, problems, and completed drawings. Two periods, second and third terms. Required of Sophomores in Civil Engineering. Two periods. Required of Juniors in Civil Engineering. Mr. FISH.

72. Bridge Design.—Calculation of stresses, design, specifications, and estimate of cost of a wooden roof truss and a steel highway bridge. Three periods, second and third terms. Required of Seniors in Civil Engineering. Mr. FISH.

73. Municipal Engineering.—Text book, lectures. Two periods, second and third terms. Required of students in Civil Engineering. Professor RIDDICK.

74. Surveying (Field-work).—Triangulation and topography, surveys for sewers, water-works, etc. Three periods. Required of Seniors in Civil Engineering. Mr. FISH.

75. 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. FISH.

76. 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 Engineering. Professor RIDDICK.

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

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

79. Road-making.—Text-book on construction of roads, streets, and pavements. Lectures on practical road-making in North Carolina. One period, second and third terms. Required of Seniors in Civil Engineering. Professor RIDDICK.

ARCHITECTURE.

80. Architecture.—Building materials, method 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. Professor RIDDICK.

81. 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. STURGILL.

MATHEMATICS.

82. Arithmetic.—Milne's *Standard Arithmetic*. Begin with decimal fractions and complete the subject. Five periods, first term. Required of first-year students in Mechanic Arts. Mr. FISH and Mr. STURGILL.

83. Algebra.—Wells's *Higher Algebra*. Up to quadratic equations. Five periods, second and third terms. Required of students in first year of short course in Mechanic Arts. Mr. FISH and Mr. STURGILL.

84. Advanced Algebra.—Wells's *Higher Algebra*. Begin at quadratic equations; general theory of equations, solution of higher equations, etc. Four periods, first and second terms. Required of all Freshmen and second-year students in Mechanic Arts. Mr. YATES and Mr. FISH.

85. Geometry.—Plane and Solid. Wentworth's *Plane and Solid Geometry*. Four periods, third term. Required of all Freshmen in full courses, and of second-year students in Mechanic Arts. Four periods, first term. Required of Sophomores. Mr. YATES.

86. Trigonometry.—Four periods, second and third terms. Required of Sophomores. Mr. YATES.

87. Analytical Geometry.—Nichols's *Analytical Geometry*. Conic sections, higher plane curves, Geometry of three dimensions. Four periods, first and second terms. Required of Juniors. Mr. YATES.

88. Calculus.—Osborne's *Elements of Calculus*. Differential and integral, elements of differential equations. Four periods, third term. Required of Juniors. Two periods, first term. Required of Seniors. Professor RIDDICK.

89. 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. Professor RIDDICK.

90. Book-keeping.—The work in the text-books supplemented by numerous original examples and sets for practice. One period. Required of Freshmen. Mr. YATES.

**COURSES IN MECHANICAL ENGINEERING AND
MECHANIC ARTS.**

The regular four-year course in Mechanical Engineering is intended to fit the student for positions of responsibility in engineering-work, and also to furnish him with a basis to carry on more advanced engineering studies.

The two-year course is offered to students who wish to become machinists, or to become competent to care for and operate engines and boilers.

Special courses in cabinet-making, boiler and engine-tending, machinists' work, or drawing, extending over a year or less, are offered to those who wish to devote a limited time to training in some particular subject, as named above.

III. The Four Year Course in Mechanical Engineering, leading to the degree of Bachelor of Engineering.

Freshman Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Free-hand Drawing, 91 -----	2	--	--
Mechanical Drawing, 92 -----	--	2	2
Wood-work, 96 -----	1	1	1
Forge-work, 97 -----	1	1	1
Mechanical Technology, 102 -----	1	1	1
Algebra, 84 -----	4	4	--
Geometry, 85 -----	--	--	4
Physics, 112 -----	2	2	2
English, 132 -----	3	3	3
History, 138 -----	2	2	2
Book-keeping, 90 -----	1	1	1
Military Drill, 141 -----	3	3	3

Sophomore Year.

Mechanical Drawing, 93 -----	2	2	2
Forge-work, 98 -----	1	--	--
Pattern-making, 99 -----	--	1	1
Mechanical Processes, 103 -----	1	1	1
Geometry, 85 -----	4	--	--
Trigonometry, 86 -----	--	4	4
Electricity and Magnetism, 113 -----	2	2	2
Inorganic Chemistry, 127 -----	3	3	3
Inorganic Chemistry (laboratory), 128 -----	2	2	2
English, 133 and 135 -----	2	2	2
Military Drill, 141 -----	3	3	3

Junior Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Steam-engine, 104.....	2	2	2
Mechanics, 89.....	3	3	3
Machine Design, 94.....	2	2	2
Machinists' Work, 100.....	2	2	2
Analytical Geometry, 87.....	4	4	—
Calculus, 88.....	—	—	4
Dynamo Machinery, 116.....	2	2	2
English and History, 139 and 136.....	2	2	2
Military Tactics, 142.....	1	1	1
Military Drill, 141.....	3	3	3

Senior Year.

Calculus, 88.....	2	—	—
Hydraulics, 76.....	—	2	2
English or Political Economy, 136 and 134 or 140.....	2	2	2
Mechanical Engineering (laboratory), 108.....	1	1	1
Machinists' Work, 101.....	3	3	2
Boiler and Engine Design, 95.....	4	4	4
Elementary Mechanism, 106.....	1	1	1
Industrial Chemistry, 129.....	—	—	2
Applied Mechanics, 107.....	2	2	2
Boilers and Engines, 105.....	2	2	1
Military Drill, 141.....	3	3	3

IIIa. The Two Year Course in Mechanic Arts.**First Year.**

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Free-hand Drawing, 91	2	--	--
Mechanical Drawing, 92	--	2	2
Wood-work, 96	2	2	2
Forge-work, 97	1	1	1
Arithmetic, 82	5	--	--
Algebra, 83	--	5	5
English, 131	3	3	3
History, 137	2	2	2
Mechanical Technology, 102	1	1	1
Military Drill, 141	3	3	3

Second Year.

Mechanical Drawing, 109	3	3	3
Machinists' Work, 107	3	3	3
Drawing, 109, or Machinists' Work, 101	4	4	4
Algebra, 84	4	4	--
Geometry, 85	--	--	4
Mechanical Technology, 110	2	2	2
Engines and Boilers, 111	2	2	2
Military Drill, 141	3	3	3

SPECIAL COURSES.**IIIb. Carpentry.**

Bench and Machine Carpentry	12	12	12
Mechanical Drawing	4	4	4
Running Engines, Care Shafts and Belting	4	4	4

IIIc. Machine Shop.

Machinists' Work	12	12	12
Mechanical Drawing	4	4	4
Running Engines, Care Shafts and Belting	4	4	4

III*d*. Engine and Boiler-tending.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Firing Boilers.....	8	8	8
Engine-running, Care Pumps, Shafts, and Belting.....	6	6	6
Machinists' Repair Work.....	4	4	4

III*e*. Drawing.

Mechanical Drawing.....	12	12	12
Arithmetic 82.....	5	--	--
Algebra 83.....	--	5	--
Geometry 85.....	--	--	4

MECHANICAL ENGINEERING.

Equipment.

The drawing and recitation-rooms, laboratory and shops of the Department of Mechanical Engineering are in the Engineering Building. They are of ample size and well lighted, and are arranged to be heated either by the exhaust steam from the engine or by live steam. On the first floor are a recitation-room, engineering laboratory, machine shop, forge shop, wood-turning shop, and carpenter shop. On the second floor are the office, three drawing-rooms, and a library. In the latter various scientific and technical journals are kept on file, the trade circulars of prominent engineering firms, drawings and photographs of machinery, and tabulated data, as well as a large number of engineering books, the use of which is required. In this way modern engineering practice is made in a measure familiar.

The laboratory is provided with the necessary apparatus for making boiler and engine tests and other work of an experimental character. The equipment consists of a two-horse-power engine, a ten-horse-power engine (both of which were built by the students), a twenty-five-horse-power Woodbury engine, a large Wheeler surface condenser, connected with a $4\frac{1}{2} \times 6 \times 8$ Blake air-pump, a large Ericsson hot-air pumping engine, apparatus for making analysis of flue gases, a hydraulic ram, a large Sturtevant fan and engine, a small water-

motor, a Worthington water-meter, friction brakes, weirs, indicators, planimeters, slide rules, thermometers, calorimeters, gauges, tanks, scales, a Crosby gauge tester, and other apparatus for making tests.

In addition to the laboratory, there is a boiler-house equipped with three thirty-horse-power boilers, several pumps, and a jet condenser, all of which are available for experimental purposes.

The shops are equipped as follows:

The wood-working equipment consists of fifteen double carpenters' benches, which accommodate thirty students, and all necessary tools for each bench; thirty 12-inch swing 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 30-inch band saw; a large jig saw; a shaper or edge moulding machine, with a very complete set of moulding cutters; a 38-inch grindstone; a wood trimmer; an adjustable mitre-box; a steam glue-heater and a large assortment of screw clamps and of bar carpenters' clamps, both iron and wooden.

The forge shop is a well lighted and ventilated room, 30 by 40 feet. There are forges enough to give twenty-eight separate fires. Each fire has its own anvil, hand tools, etc. During the past year a complete underground blast system has been installed, which furnishes blast from a Sturtevant blower to each fire. Also a complete exhaust system, operated by a 60-inch Sturtevant exhaust fan and direct connected engine, has been put in for removing all smoke, waste gases and cinders from the fires.

The machine shop contains a 16-inch swing Davis and Egan lathe with 10-foot bed, a 14-inch Winsor lathe with 3-foot bed, a 13-inch Barnes lathe with 5-foot bed, a 14-inch Putnam lathe with 4-foot bed, a 18-inch Prentiss shaper, a 24-inch upright Bickford drill press, a Brown and Sharp universal milling machine with all attachments, a 20-inch by 5-foot Pease planer, a large emery tool-grinding machine. The machine tools have full equipment of chucks, rests, and tools. The benches are well provided with vises.

The tool-room is well equipped with the necessary hand and pipe tools.

The power for the shops is furnished by a 25-horse-power Woodbury engine. When the shops are running one of the students has charge of the engine and another of the boilers.

Subjects of Instruction.

91. Free-hand Drawing.—Work in the use of the pencil; isometric sketches; technical sketches of objects, usually parts of a machine. Two periods, first term. Required of all Freshmen and first-year students in Mechanic Arts. Mr. CHITTENDEN.

92. Elementary Mechanical Drawing.—Use of instruments, geometric drawing, isometric drawing, elementary projections, drawings made to scale from working sketches of pieces of a machine. Two periods, second and third terms. Required of all Freshmen and first-year students in Mechanic Arts. Mr. CHITTENDEN.

93. Mechanical Drawing.—Working sketches and drawings of machine parts from the model. Tracing and blue-printing. Elementary machine design. Two periods. Required of Sophomores in Mechanical, Electrical, and Mining Engineering. Mr. CHITTENDEN.

94. Machine Design.—Calculations and working drawings of machine parts, such as fastenings, shafting, hangers, couplings, bearings, belt and tooth gearing, pulleys, pipe and pipe couplings. Two periods. Required of Juniors in Mechanical Engineering. Professor DICK.

95. Boiler and Engine Design.—Calculations and working drawings of types of engines, boilers, pumps, condensers. Outline of power plant design. Four periods. Required of Seniors in Mechanical Engineering. Professor DICK.

96. Wood-work.—Use of bench tools, working from drawings, lining, sawing, planing. Practice in making simple exercises in wood. Elementary exercises in wood-turning. Handling of wood lathes and tools. One period. Required of Freshmen. Two periods. Required of first-year students in Mechanic Arts. Mr. BRAGG and Mr. CARTER.

97. Forge-work.—Exercises in working with iron. Welding. Uses and care of forge tools and fires. One period. Required of Freshmen and first-year students in Mechanic Arts. Mr. OLIVER CARTER.

98. Forge-work.—Exercises in working with steel. Tempering. Case-hardening. One period, first term. Required of Sophomores in Mechanical and Mining Engineering. Mr. OLIVER CARTER.

99. Pattern-making.—Exercises in making patterns of machine parts. One period, second and third terms. Required of Sophomores in Mechanical and Mining Engineering. Mr. BRAGG and Mr. CARTER.

100. Machinists' 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 Sophomores in Electrical Engineering. Seven periods. Required of second-year students in Mechanic Arts. Mr. PARK.

101. Machinists' Work.—Making the parts of some machine, or of an engine. Making tools, such as taps and reamers. Laying out work. Three periods, first and second terms; two periods, third term. Required of Seniors in Mechanical Engineering. Mr. PARK.

102. Mechanical Technology.—Classification and uses of wood-working and forging tools and machines. Methods of wood-working and forging. Care of belting and shafting. One period. Required of Freshmen and first-year students in Mechanic Arts. Mr. CARTER.

103. Mechanical Processes.—Description of machines used in engineering work. Methods of pattern-making, moulding, casting, and heavy forging. Description of various machine tools and methods of performing work on them; boiler-making and plate-work. One period. Required of Sophomores in Mechanical Engineering. Professor DICK.

104. Steam-engine.—Descriptive study of the simple steam-engine. Names and uses of the various parts of an engine. Various types of engines, fittings, foundations, and piping. Different types of boilers and settings. Arrangement of power plants. Care of engines and boilers. Two periods. Required of Juniors in Mechanical Engineering. Professor DICK.

105. Boilers and Engines.—Description and theory of boilers and engines, valve gears. Elementary thermodynamics. Principles involved in engine and boiler design. Two periods, first and second terms. One period, third term. Required of Seniors in Mechanical Engineering. Professor DICK.

106. Principles of Mechanism.—Study of the communication of motion by gear-wheels, cams, screws, belts, and link-work; automatic feed motions; epicyclic trains; parallel and quick return motions. Problems. One period. Required of Seniors in Mechanical Engineering. Professor DICK.

107. Applied Mechanics.—Strength of materials, structures, and machine parts; energy and transmission of power to machines. Problems, with special reference to design of machines and machine parts. Two periods. Required of Seniors in Mechanical Engineering. Professor DICK.

108. Mechanical Engineering Laboratory.—Practice in engine and boiler-running; valve-setting; calibration of instruments; testing gauges; lubricants. Use of indicators and calorimeters. Tests of boilers and engines. One period. Required of Seniors in Mechanical Engineering. Professor DICK.

109. Mechanical Drawing.—Sketching and drawing of machine parts and machines. Detail working drawings. Tracing and blue-printing. Three periods. Required of second-year students. Mr. CHITTENDEN.

110. Mechanical Technology.—Classification and use of hand-tools and machines usually found in the pattern shop, foundry, and machine shop. Materials used and methods of carrying on work in these shops. Practical problems in estimating cost and material required to complete a piece of work; arrangements and sizes of belting, pulleys, and shafting. Two periods. Required of second-year students. Mr. CARTER.

111. Engines and Boilers.—Descriptive study of ordinary engines and boilers; proper methods of handling them. Care of pumps, condensers, engine and boiler fittings. Actual practice in engine-tending, boiler-firing, and dynamo-tending is also given with this course. Two periods. Required of second-year students. Professor DICK.

COURSE IN ELECTRICAL ENGINEERING.

Object.—The work in this department is designed for those who wish a thorough and practical training in Electrical Engineering. Only a most thorough training in the fundamental facts and principles of the science of electricity and magnetism will be satisfactory for a branch of engineering which is advancing so rapidly. A great deal of attention is, therefore, paid to good text-book work, and as soon as the first principles of the science are mastered by the student he is given a series of experiments in which careful measurements with exact instruments are made.

The department, as can be seen from the list of apparatus, is well equipped with dynamos, electric motors, and testing instruments for experimental work and for investigation of problems in electrotechnics. During the Senior year a course in designing the various electrical machines is given.

IV. The Four Year Course in Electrical Engineering, leading to the degree of Bachelor of Engineering.

Freshman Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Free-hand Drawing, 91 -----	2	--	--
Mechanical Drawing, 92 -----	--	2	2
Wood-work, 96 -----	1	1	1
Forge-work, 97 -----	1	1	1
Mechanical Technology, 102 -----	1	1	1
Algebra, 84 -----	4	4	--
Geometry, 85 -----	--	--	4
Book-keeping, 90 -----	1	1	1
Elementary Physics, 112 -----	2	2	2
English, 132 -----	3	3	3
History, 138 -----	2	2	2
Military Drill, 141 -----	3	3	3

Sophomore Year.

X Mechanical Drawing, 93 -----	2	2	2
Geometry, 85 -----	4	--	--
Trigonometry, 86 -----	--	4	4
Inorganic Chemistry, 127 -----	3	3	3
Inorganic Chemistry (laboratory) 128 -----	2	2	2
Machinists' Work, 100 -----	1	1	1
Physical Laboratory, 114 -----	1	1	1
Electricity and Magnetism, 113 -----	2	2	2
English, 133 and 135 -----	2	2	2
Military Drill, 141 -----	3	3	3

Junior Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Dynamo Machinery, 116.....	2	2	2
Electrical Laboratory, 115.....	2	--	--
Electrical Engineering (laboratory), 120..	--	2	2
Steam-engine, 104.....	2	2	2
Mechanics, 89.....	3	3	3
Analytical Geometry, 87.....	4	4	--
Calculus, 88.....	--	--	4
Machine Design, 94.....	2	2	2
English and History, 139 and 136.....	2	2	2
Military Tactics, 142.....	1	1	1
Military Drill, 141.....	3	3	3

Senior Year.

Alternating Currents, 117.....	3	--	--
Light and Power Plants, 118.....	--	3	--
Telephony and Telegraphy, 119.....	--	--	3
Electrical Engineering (laboratory), 121..	4	4	4
Dynamo Design, 122.....	1	2	2
Machinists' Work, 100.....	2	2	--
Mechanical Engineering (laboratory), 108..	1	--	--
Industrial Chemistry, 129.....	--	--	2
Calculus, 88.....	2	--	--
Hydraulics, 76.....	--	2	2
Political Economy, 140.....	2	2	2
Military Drill, 141.....	3	3	3
English Literature, 136 and 134.....	2	2	2

PHYSICS.

Equipment.

The recitation-rooms and laboratories of the Department of Physics are situated in the basement of the principal building. They are spacious and well lighted.

The equipment consists of apparatus for illustrating the principles of physical science and for instruction and practice in experiments, measurements, and tests.

Subjects of Instruction.

112. 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 the study of light. Two periods. Required of Freshmen. Professor WEIHE.

113. Elementary Lessons in Electricity and Magnetism.—Two periods. Required of Sophomores. Professor WEIHE.

114. Physical Laboratory.—Measurements of length, area, and volume; determinations of density; laws of forces and velocities; pendulum. Two periods. Required of Sophomores in Electrical Engineering. Mr. WALTER.

115. Electrical Laboratory.—Electric and magnetic measurements. Two periods, first term. Required of Juniors in Electrical Engineering. Mr. WALTER.

ELECTRICAL ENGINEERING.**Equipment.**

The electrical engineering laboratory is a small brick building 30x50. It contains the electric light plant, consisting of a 35-horse-power automatic Skinner engine, a 11.5 K. W. 110-volt Westinghouse dynamo and a 20 K. W. 2-phase 110-volt Lincoln alternator. The laboratory contains in addition to this one 6-light T. H. arc machine, one 1-horse-power Sprague motor, one 8 K. W. 110-volt Siemens and Halske dynamo, connected in such a way as to give 3-phase currents, one 2-horse-power 3-phase 110-volt Gen. Elect. Co. motor, one 2 K. W. 110-volt LaRoche alternator. It also contains transformers, condensers, arc lamps, circuit breakers, etc.

The department possesses a small library of standard books on all branches of physics and electrical engineering.

Subjects of Instruction.

116. Dynamo Machinery.—Dynamo-electric machines. Dynamos and motors. Efficiency. Characteristic curves. Two periods. Required of Juniors in Mechanical and Electrical Engineering. Professor WEIHE.

117. Alternating Currents of Electricity.—Alternating current generators and motors. Static and rotary transformers. Condensers. Three periods, first term. Required of Seniors in Electrical Engineering. Professor WEIHE.

118. Electric Light and Power Plants.—Storage batteries. Transmission of electric power. Three periods, second term. Required of Seniors in Electrical Engineering. Professor WEIHE.

119. Telephony and Telegraphy.—Three periods, third term. Required of Seniors in Electrical Engineering. Professor WEIHE.

120. Electrical Engineering Laboratory.—Standardizing of measuring instruments. Measurements of power. Characteristic curves. Two periods, second and third terms. Required of Juniors in Electrical Engineering. Mr. WALTER.

121. Electrical Engineering Laboratory.—Efficiency tests of direct and alternating current dynamos and motors and of transformers. Efficiency tests of electric plants. Photometry. Four periods. Required of Seniors in Electrical Engineering. Mr. WALTER.

122. Dynamo Design.—Design of dynamos, motors, and transformers. One period, first term; two periods, second and third terms. Required of Seniors in Electrical Engineering. Professor WEIHE and Mr. WALTER.

COURSE IN MINING ENGINEERING.

The course in Mining Engineering is intended to give the student the necessary preliminary training to enable him to enter upon a career in mining. To this end he is given instruction in English, History, Political Economy, and Mathematics, which are fundamental to the more technical studies and to the greatest usefulness as a citizen. Physics and Chemistry, Mineralogy and Geology, Surveying, Shop-work, Drawing, Machinery and Steam afford the scientific and engineering knowledge upon which the successful work of the miner must depend. The more technical portion of the instruction includes ore-dressing, metal-working, ventilation, drainage, and illumination of mines.

Students wishing to specialize in Metallurgy will please see Courses in Chemistry.

V. The Four Year Course in Mining Engineering, leading to the degree of Bachelor of Engineering.

Freshman Year.

SUBJECTS.	PERIODS PER WRRK.		
	1st Term.	2d Term.	3d Term.
Free-hand Drawing, 91 -----	2	--	--
Mechanical Drawing, 92 -----	--	2	2
Wood-work, 96 -----	1	1	1
Forge-work, 97 -----	1	1	1
Mechanical Technology, 102 -----	1	1	1
Algebra, 84 -----	4	4	--
Geometry, 85 -----	--	--	4
Book-keeping, 90 -----	1	1	1
Physics, 112 -----	2	2	2
English, 132 -----	3	3	3
History, 138 -----	2	2	2
Military Drill, 141 -----	3	3	3

Sophomore Year.

Mechanical Drawing, 93 -----	2	2	2
Forge-work, 98 -----	1	--	--
Pattern-making, 99 -----	--	1	1
Mechanical Processes, 103 -----	1	1	1
Geometry, 85 -----	4	--	--
Trigonometry, 86 -----	--	4	4
Electricity and Magnetism, 113 -----	2	2	2
Inorganic Chemistry, 127 -----	3	3	3
Inorganic Chemistry (laboratory), 128 -----	2	2	2
English, 133 and 135 -----	2	2	2
Military Drill, 141 -----	3	3	3

Junior Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Geology and Mineralogy, 126 -----	4	4	4
Construction, 77 -----	2	2	2
Steam-engine, 104 -----	2	2	2
Mechanics, 89 -----	3	3	3
Analytical Geometry, 87 -----	4	4	--
Calculus, 88. -----	--	--	4
English and History, 139 and 136 -----	2	2	2
Military Tactics, 142 -----	1	1	1
Military Drill, 141 -----	3	3	3

Senior Year.

Mining, 123 -----	3	3	3
Ore Deposits, 125 -----	--	2	2
Ore Dressing, 124 -----	2	2	2
Metallurgy, 130 -----	4	4	4
Hydraulics, 76 -----	--	2	2
Surveying, 68 -----	2	--	--
Surveying (field-work), 70 -----	2	--	--
English, 136 and 134 -----	2	2	2
Political Economy, 140 -----	2	2	2
Military Drill, 141 -----	3	3	3

MINING ENGINEERING.

123. Mining.—Lectures on methods of mining, including prospecting, sinking, stoping, hoisting, pumping, and ventilating; the location of mining claims, mine fires, fire-damp and dust explosions; inundations; rescue and relief of men. Three periods. For Seniors in Mining Engineering.

124. Ore Dressing.—Furnishing products for metallurgical treatment. Lectures on concentrating machinery and concentrating and enriching ores by mechanical means. Two periods. For Seniors in Mining Engineering.

125. Ore Deposits.—A discussion of the general features and the formation of ore bodies, followed by a description of the deposits of iron, copper, lead, zinc, silver, gold, and the lesser metals, and the occurrence of coal, petroleum, natural gas, asphalt, building stones, etc.,

with special reference to North America. Two periods, second and third terms. For Seniors in Mining Engineering.

126. Mineralogy and Geology.—A discussion of the elements of these subjects. Four periods. For Juniors in Mining Engineering.

CHEMISTRY.*

127. Inorganic Chemistry.—Remsen's *Introduction to the Study 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. Three periods. Required of Sophomores. Professor WITHERS and Doctor FRAPS.

128. Inorganic Chemistry.—Laboratory work. Remsen and Randall's *Laboratory Guide*. The student performs under the eye of the instructor experiments designed to illustrate and emphasize the work of the class-room. He records in a note-book his observations and the conclusions drawn from them. Two periods. Required of Sophomores. Mr. SYMA.

129. Industrial Chemistry.—A discussion of the materials of engineering. Two periods, third term. Required of Seniors in Mechanical and Electrical Engineering. Professor WITHERS.

130. Metallurgy.—A study of fuel and its uses; iron and steel, copper, lead, gold, and silver, their properties, tests; ores and details of methods of reduction. Four periods. For Seniors.

ENGLISH.

131. English Composition.—A drill upon the forms of the language, the correct relation of words, the sentence and its adjustment. Daily written exercises. Three periods. Required of first-year students. Mr. OWEN.

132. Introductory Rhetoric and Composition.—Scott & Denney's *Composition Rhetoric* and Buehler's *Exercises* are used as texts. These are accompanied by drills on the forms of the language and methods of sentence formation. The student is taught to plan all work, and every effort is made to develop his constructive faculties. Three periods a week. Required of all Freshmen. Professor HILL and Mr. OWEN.

133. Rhetoric.—Newcomer's *Rhetoric*.—The organic parts of discourse and the essential qualities of good style are considered.

* For further information see Courses in Chemistry.

Especial study is given this year to themes in narration and description. Many exercises are required. Required of all Sophomores. Two periods, first and second terms. Professor HILL.

134. Analysis and Construction of Themes in Exposition and Argumentation.—Two periods, third term. Required of Seniors. Professor HILL.

135. American Literature.—By means of an introductory text and by much reading students are introduced to what is best in the literature of their own country. Books are studied at first hand. Synopses, paraphrases, and critiques required. Two periods, third term. Required of Sophomores. Professor HILL.

136. English Literature.—The development of English Literature through its great periods and through its representative men. Much parallel reading is required. In a general way Minto's plan of study is followed. Two periods, third term. Required of Juniors. Two periods, first and second terms. Required of all Seniors. Professor HILL.

HISTORY.

137. American History.—By means of a text-book supplemented by lectures and frequent assignment of topics for special study, students are in this course familiarized with the leading facts in the history of the United States. Two periods. Required of first-year students. Professor PHELPS.

138. Ancient and Modern History.—The student, by means of text-book and informal lectures, is introduced to the leading facts in the world's history, and to the significance and consequences of these facts. While historic sequence is carefully noted, the student follows, as far as possible, the topical method. Two periods. Required of all Freshmen. Professor PHELPS.

139. English History.—The first term of the Junior year is devoted to a study of English history. The text is supplemented by lectures on important periods. Two periods, first and second terms. Required of Juniors. Professor HILL.

POLITICAL ECONOMY.

140. Political Economy.—This course deals with public problems relating to the production, distribution, and exchange of wealth. The leading topics discussed are capital, wages, money, transportation, and taxation. Instruction is given by lectures and text-books. Two periods. Required of Seniors. President WINSTON.

MILITARY SCIENCE.

141. Drill.—Schools of the Soldier, Company and Battalion in Close and Extended Order; Ceremonies; Marches and Minor Tactics. United States Infantry Drill Regulations. Three hours in the afternoon. Required of all classes. Commandant and officers of the Battalion.

142. Tactics.—Theoretical instruction in the Schools of the Soldier, Company, and Battalion in close and Extended Order; Ceremonies, etc. One period. Required of all Juniors. Captain PHELPS.

COURSES IN CHEMISTRY, DYEING, AND METALLURGY.

- VI. The Four Year Course in Chemistry and Engineering.**
- VIa. The Four Year Course in Chemistry and Dyeing.**
- VIb. The Four Year Course in Chemistry and Metallurgy.**

COURSES IN CHEMISTRY.

In harmony with the general purposes for which the college was founded, the courses in chemistry are arranged to prepare young men for careers in connection with the various chemical industries either in the analytical or the operating departments. To this end the training given in general, organic, and analytical chemistry is supplemented by instruction in technical chemical analysis and in the applied chemical subjects bearing more directly on the course the student has selected. The fundamental principles of engineering, machinery, etc., which are almost indispensable to the successful management of chemical plants, are taught, together with the cultural studies included in the other courses.

Raleigh as a Chemical Centre.

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

The chemical laboratories of the North Carolina Department of Agriculture and of the North Carolina Agricultural Experiment Station are located in Raleigh, and through the courtesy of these departments our students are welcomed whenever they desire to visit them.

The Berzelius Chemical Society—composed of the professional chemists residing in Raleigh and its vicinity—invites the students of this College to attend any and all meetings.

The State Museum is open to the public each day from 9 o'clock a. m. to 5 o'clock p. m. and among other things contains a very excellent collection of minerals, ores, and building stones found in the State.

Chemical Equipment.

The laboratories of general and of analytical chemistry are located in the main building of the College, and are well furnished. The tables are of yellow heart pine with oak tops. Each student is provided with water, gas, all necessary reagents, ample working space, together with lockers for the storage of apparatus, etc. The quantitative laboratory is located on the first floor and will accommodate thirty-two students. The laboratory for introductory chemical work is in the basement and will accommodate seventy students.

The chemical library is well supplied with reference books and chemical journals. The department owns complete sets of many of the leading chemical journals, as well as the current numbers.

Graduates in Chemistry.

The chemical graduates of the College are engaged in the following lines of chemical work: Manufacture of illuminating gas, manufacture of sulphuric acid, manufacture of fertilizers, manufacture of tobacco products, refining and testing of oils, metallurgy of iron, metallurgy of copper, dyeing of cotton goods, in agricultural experiment stations, in State departments of agriculture, and in teaching chemistry. These are employed in North Carolina and seven other States.

On account of the extent of the subject of applied chemistry, three courses have been arranged. They are given below.

The Four Year Course in Chemistry and Engineering.

This course is intended to fit young men for work in the various chemical industries, excepting metallurgy and dyeing, for which separate courses are provided. These include such lines of work as the manufacture of sulphuric acid, fertilizers, illuminating gas, soaps, leather, paper, glass, and the heavy chemicals; the extraction and refining of oils; the ceramic industries, etc. The student is also trained in the principles and practice of technical analysis, after laying a good foundation in the pure science. The instruction in the engineering subjects is almost indispensable to the successful conduct of a manufacturing plant and the culture studies to success in any line of work.

VI. The Four Year Course in Chemistry and Engineering,
leading to the Degree of Bachelor of Engineering.

Freshman Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Free-hand Drawing, 165.....	2	--	--
Mechanical Drawing, 166.....	--	2	2
Wood-work, 168.....	1	1	1
Forge-work, 169.....	1	1	1
Mechanical Technology, 171.....	1	1	1
Algebra, 177.....	4	4	--
Geometry, 178.....	--	--	4
Book-keeping, 183.....	1	1	1
English, 184.....	3	3	3
History, 189.....	2	2	2
Physics, 159.....	2	2	2
Military Drill, 192.....	3	3	3

Sophomore Year.

Inorganic Chemistry, 143.....	3	3	3
Inorganic Chemistry (laboratory), 144.....	2	2	2
Electricity and Magnetism, 160.....	2	2	2
Physical Laboratory, 161.....	1	1	1
Mechanical Drawing, 167.....	2	2	2
Machinists' Work, 170.....	1	1	1
Geometry, 178.....	4	--	--
Trigonometry, 179.....	--	4	4
English, 185 and 187.....	2	2	2
Military Drill, 192.....	3	3	3

Junior Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Organic Chemistry, 145.....	2	2	2
Analytical Methods, 147.....	1	1	1
Analytical Chemistry (laboratory) 148....	2	2	2
Dynamo Machinery, 163.....	2	2	2
Electrical Laboratory, 162.....	2	—	—
Electrical Engineering Laboratory, 164....	—	2	2
Steam-engine, 172.....	2	2	2
Analytical Geometry, 180.....	4	4	—
Calculus, 181.....	—	—	4
English and History, 190 and 188.....	2	2	2
Military Tactics, 193.....	1	1	1
Military Drill, 194.....	3	3	3

Senior Year.

Industrial Chemistry, 151 and 152.....	2	2	2
Technical Chemical Analysis, 149.....	4	4	4
Organic Chemistry (laboratory), 146.....	3	3	3
Mechanics, 182.....	3	3	3
Mechanical Engineering Laboratory, 173....	1	1	1
English, 188 and 186.....	2	2	2
Political Economy, 191.....	2	2	2
Military Drill, 192.....	3	3	3

The Four Year Course in Chemistry and Dyeing.

The primary object of the Course in Dyeing is to educate boys who intend to become dyers in cotton mills, or other establishments. The course of study involves thorough grounding in English, history, mathematics, physics, and chemistry, with training in drawing and in the use of tools. Then come the more specialized courses; in dyeing, which involves the practical and theoretical study of dyes and mordants, their uses, applications, and methods of testing them, with dye-house work; the study of industrial chemistry and of technical analysis, which includes the analysis of the substances most important to dyers; and the study of the production of power by steam and electricity.

In the work in dyeing and in chemistry, particular emphasis is laid upon the work which the student does with his own hands in laboratory and dye-house. He handles and tests dyes, yarns, and fabrics, and becomes familiar with them through the work he does on them.

Via. The Four Year Course in Chemistry and Dyeing, leading to the degree of Bachelor of Engineering.

Freshman Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Free-hand Drawing, 165	2	--	--
Mechanical Drawing, 166	--	2	2
Wood-work, 168	1	1	1
Forge-work, 169	1	1	1
Mechanical Technology, 171	1	1	1
Algebra, 177	4	4	--
Geometry, 178	--	--	4
Book-keeping, 183	1	1	1
Physics, 159	2	2	2
English, 184	3	3	3
History, 189	2	2	2
Military Drill, 192	3	3	3

Sophomore Year.

Inorganic Chemistry, 143	3	3	3
Inorganic Chemistry (laboratory), 144	2	2	2
Electricity and Magnetism, 160	2	2	2
Physical Laboratory, 161	1	1	1
Carding and Spinning, 158	1	1	1
Mechanical Drawing, 167	2	2	2
Geometry, 178	4	--	--
Trigonometry, 179	--	4	4
English, 185 and 187	2	2	2
Military Drill, 192	3	3	3

Junior Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Textile Chemistry and Dyeing, 153.....	2	2	2
Textile Chemistry and Dyeing (lab'y), 154.....	2	2	2
Organic Chemistry, 145.....	2	2	2
Analytical Methods, 147.....	1	1	1
Analytical Chemistry, (laboratory), 148.....	2	2	2
Dynamo Machinery, 163.....	2	2	2
Electrical Laboratory, 162.....	2	2	2
Electrical Engineering Laboratory, 164.....	2	2	2
Steam-engine, 172.....	2	2	2
English and History, 190 and 188.....	2	2	2
Military Tactics, 193.....	1	1	1
Military Drill, 192.....	3	3	3

Senior Year.

Dyeing, 156.....	2	2	2
Dyeing Laboratory, 157.....	3	3	3
Chemistry of Dye-stuffs, 155.....	2	2	2
Industrial Chemistry, 151 and 152.....	2	2	2
Technical Chemical Analysis, 149.....	4	4	4
English, 188 and 186.....	2	2	2
Political Economy, 191.....	2	2	2
Military Drill, 192.....	3	3	3

Vib. The Four Year Course in Chemistry and Metallurgy,
leading to the degree of Bachelor of Engineering.

Freshman Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Free-hand Drawing, 165	2	--	--
Mechanical Drawing, 166	--	2	2
Wood-work, 168	1	1	1
Forge-work, 169	1	1	1
Mechanical Technology, 171	1	1	1
Algebra, 177	4	4	--
Geometry, 178	--	--	4
Book-keeping, 183	1	1	1
Physics, 159	2	2	2
English, 184	3	3	3
History, 189	2	2	2
Military Drill, 192	3	3	3

Sophomore Year.

Inorganic Chemistry, 143	3	3	3
Inorganic Chemistry (laboratory), 144	2	2	2
Electricity and Magnetism, 160	2	2	2
Physical Laboratory, 161	1	1	1
Mechanical Drawing, 167	2	2	2
Machinists' Work, 170	1	1	1
Geometry, 178	4	--	--
Trigonometry, 179	--	4	4
English, 185 and 187	2	2	2
Military Drill, 192	3	3	3

Junior Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Geology and Mineralogy, 175 -----	4	4	4
Analytical Methods, 147 -----	1	1	1
Analytical Chemistry (laboratory), 148 -----	2	2	2
Organic Chemistry, 145 -----	2	2	2
Dynamo Machinery, 163 -----	2	2	2
Electrical Laboratory, 162 -----	2	—	—
Electrical Engineering Laboratory, 164 -----	—	2	2
Steam-engine, 172 -----	2	2	2
English and History, 190 and 188 -----	2	2	2
Military Tactics, 193 -----	1	1	1
Military Drill, 192 -----	3	3	3

Senior Year.

Metallurgy, 176 -----	4	4	4
Ore-dressing, 174 -----	2	2	2
Assaying, 150 -----	1	1	1
Technical Chemical Analysis, 149 -----	4	4	4
Industrial Chemistry, 151 and 152 -----	2	2	2
English, 188 and 186 -----	2	2	2
Political Economy, 191 -----	2	2	2
Military Drill, 192 -----	3	3	3

CHEMISTRY.

143. Inorganic Chemistry.—Rensen's *Introduction to the Study 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. Three periods. Required of Sophomores. Professor WITHERS and Doctor FRAPS.

144. Inorganic Chemistry.—Laboratory work. Rensen and Randall's *Laboratory Guide*. The student performs under the eye of the instructor experiments designed to illustrate and emphasize the work of the class-room. He records in a note-book his observations and

* For Agricultural Chemistry see Agricultural Courses in Department of Chemistry.

the conclusions drawn from them. Two periods. Required of Sophomores. Mr. SYME.

145. 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. Two periods. Elective for Seniors. Mr. BIZZELL.

146. Organic Chemistry.—Laboratory work. Orndorff's *Laboratory Manual*, supplemented by reference books. This work is designed to familiarize the student with the more important organic compounds and with the processes involved in their preparation. Three periods. Required of Seniors in the course in Chemistry and Engineering. Doctor FRAPS.

147. Analytical Methods.—A discussion of methods and principles involved in qualitative and quantitative analysis. One period. Required of Juniors. Professor WITHERS.

148. Analytical Chemistry (Introductory).—Laboratory work. Caldwell's *Chemical Analysis*. The student is taught to detect the presence of the more common elements in unknown substances. He is given practice in introductory gravimetric and volumetric quantitative work. Two periods. Required of Juniors. Mr. SYME.

149. Technical Analysis.—Laboratory work. The work of the student is continued in quantitative analysis, special attention being given to the analysis of those substances most closely connected with the course of the student. Four periods. Required of Seniors. Professor WITHERS and Mr. BIZZELL.

150. Assaying.—Practice work in the assaying of gold, silver, and lead ores by furnace methods. Two periods. For Seniors in Metallurgy.

151. Industrial Chemistry.—Thorpe's *Outlines of Industrial Chemistry*. A discussion of the processes and principles involved in the more important chemical industries. Two periods, first and second terms. Required of Seniors. Professor WITHERS.

152. Industrial Chemistry.—A discussion of the materials of engineering. Two periods, third term. Required of Seniors. Professor WITHERS.

DYEING.*

153. Textile Chemistry and Dyeing.—Lectures. A study of the chemistry of the textile fibers, and the principles involved in bleaching, dyeing, and printing. The student becomes acquainted with the

*For further information see outline of Textile Courses.

methods and machinery for dyeing cotton, wool, silk, and mixed goods, and learns the most important dyes now in use. Two periods. Required of Juniors. Doctor FRAPS.

154. Textile Chemistry and Dyeing.—Laboratory work. The experiments are designed to accompany Course 153. Working with small skeins of yarns, the student learns different methods of dyeing, applies a number of dyes, tests their fastness to washing, and other agencies, and applies other tests. All dyed skeins and fastness tests are entered in suitable scrap-books. Two periods. Required of Juniors. Doctor FRAPS.

155. Chemistry of Dye-stuffs.—Nietzski's *Chemistry of the Organic Dye-stuffs*. A study of the chemical composition of dye-stuffs, and the processes involved in their manufacture. Two periods. Required of Seniors.

156. Dyeing.—Lectures. A further study of the properties and modes of application of dye-stuffs and mordants, especially those applied to cotton. Detailed study is made of certain important methods of dyeing cotton, as indigo, turkey red, aniline black, etc. Two periods. Required of Seniors.

157. Dyeing Laboratory.—Involves the bleaching and dyeing of cotton in the dye-house, dyeing to a given shade, mixing of dyes, and practical dyeing tests. The student learns how to study a new dye and devise methods for its practical application. Three periods. Required of Seniors.

CARDING AND SPINNING.*

158. Carding and Spinning.—Introductory work aimed to give the student an introduction to the machines and methods of operating. One period. For Sophomores in Dyeing. Professor WILSON.

PHYSICS.†

159. 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 the study of light. Two periods. Required of Freshmen. Professor WEIHE.

160. Elementary Lessons in Electricity and Magnetism.—Two periods. Required of Freshmen. Professor WEIHE.

*For further information see outline of Textile Courses.

†For full information see Course in Electrical Engineering.

161. Physical Laboratory.—Measurements of length, area, and volume; determinations of density; laws of forces and velocities; pendulum. One period. Required of Sophomores. Mr. WALTER.

162. Electrical Laboratory.—Electric and magnetic measurements. Two periods, first term. Required of Juniors. Mr. WALTER.

ELECTRICAL ENGINEERING.*

163. Dynamo Machinery.—Practical units. Dynamo-electric machines. Dynamos and motors. Efficiency. Characteristic curves. Two periods. Required of Juniors. Professor WEIHE and Mr. WALTER.

164. Electrical Engineering Laboratory.—Standardizing of measuring instruments. Measurements of power. Characteristic curves. Two periods, second and third terms. Required of Juniors. Mr. WALTER.

MECHANICAL ENGINEERING.†

165. Free-hand Drawing.—Work in the use of the pencil; isometric sketches; technical sketches of objects, usually parts of a machine. Two periods, first term. Required of Freshmen and first-year students. Mr. CHITTENDEN.

166. Elementary Mechanical Drawing.—Use of instruments, geometric drawing, isometric drawing, elementary projections, drawings made to scale from working sketches of pieces of a machine. Two periods, second and third terms. Required of Freshmen and first-year students. Mr. CHITTENDEN.

167. Mechanical Drawing.—Working sketches and drawings of machine parts from the model. Tracing and blue-printing. Elementary machine design. Two periods. Required of Sophomores. Mr. CHITTENDEN.

168. Wood-work.—Use of bench tools, working from drawings, lining, sawing, planing. Practice in making simple exercises in wood. Elementary exercises in wood-turning. Handling of wood lathes and tools. One period. Required of Freshmen. Mr. BRAGG and Mr. CARTER.

169. Forge-work.—Exercises in working with iron. Welding. Uses and care of forge tools and fires. One period. Required of Freshmen. Mr. OLIVER CARTER.

* For full information see Course in Electrical Engineering.

† For full information see Course in Mechanical Engineering.

170. Machinists' Work.—Bench and machine work: exercises in chipping and filing; exercises in lathe-work; boring, reaming, drilling, planing, milling, and shaper work. One period. Required of Sophomores in Industrial Chemistry and Metallurgy. Mr. PARK.

171. Mechanical Technology.—Classification and uses of wood-working and forging tools and machines; principles of correct methods of wood-working and forging; care of belting and shafting. One period. Required of Freshmen. Mr. CARTER.

172. Steam-engine.—Descriptive study of the simple steam-engine; names and use of the various parts of an engine; various types of engines and fittings, foundations, and piping; different types of boilers and settings; arrangement of power plants; care of engines and boilers. Two periods. Required of Juniors. Professor DICK.

173. Mechanical Engineering Laboratory.—Practice in engine and boiler-running; valve-setting; calibration of instruments; testing gauges and lubricants; use of indicators and calorimeters; tests of boilers and engines. One period. Required of Seniors in Chemistry and Engineering. Professor DICK.

MINING ENGINEERING.

174. Ore-dressing.—Furnishing products for metallurgical treatment. Lectures on concentrating machinery, and the concentrating and crushing of ores by mechanical processes. Two periods. For Seniors in Metallurgy.

175. Mineralogy and Geology.—A discussion of the elements of these subjects. Four periods. For Juniors in Metallurgy.

176. Metallurgy.—Fuel and its uses, iron and steel, copper, lead, gold, and silver, their properties, tests, use and details of the methods of reduction. Four periods. For Seniors in Metallurgy.

MATHEMATICS.

177. Advanced Algebra.—Wells's *Higher Algebra*. Begins at quadratic equations; general theory of equations, solution of higher equations, etc. Four periods, first and second terms. Required of all Freshmen.

178. Geometry.—Plane and Solid. Wentworth's *Plane and Solid Geometry*. Four periods, third term. Required of all Freshmen in full courses, and of second-year students in Short Courses in Mechanic Arts. Four periods, first term. Required of all Sophomores. Mr. YATES.

179. Trigonometry.—Four periods, second and third terms. Required of Sophomores. Mr. YATES.

180. Analytical Geometry.—Nichols's *Analytical Geometry*. Conic sections, higher plane curves, Geometry of three dimensions. Four periods, first and second terms. Required of Juniors in Industrial Chemistry. Mr. YATES.

181. Calculus.—Osborne's *Elements of Calculus*. Differential and integral, elements of differential equations. Four periods, third term. Required of Juniors in Industrial Chemistry. Professor RIDDICK.

182. 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 Seniors in Industrial Chemistry. Professor RIDDICK.

183. Book-keeping.—The work in the text-books supplemented by numerous original examples and sets for practice. One period. Required of all Freshmen. Mr. YATES.

ENGLISH.

184. Introductory Rhetoric and Composition.—Scott & Denney's *Composition Rhetoric* and Buehler's *Exercises* are used as texts. These are accompanied by drills on the forms of the language and methods of sentence formation. The student is taught to plan all work, and every effort is made to develop his constructive faculties. Three periods. Required of all Freshmen. Professor HILL and Mr. OWEN.

185. Rhetoric.—Newcomer's *Rhetoric*. The organic parts of discourse and the essential qualities of good style are considered. Especial study is given this year to themes in narration and description. Many exercises are required. Two periods, first and second terms. Required of all Sophomores. Professor HILL.

186. Analysis and Construction of Themes in Exposition and Argumentation.—Two periods, third term. Required of Seniors. Professor HILL.

187. American Literature.—By means of an introductory text and by much reading students are introduced to what is best in the literature of their own country. Books are studied at first hand. Synopses, paraphrases, and critiques required. Two periods, third term. Required of Sophomores. Professor HILL.

188. English Literature.—The development of English Literature through its great periods and through its representative men. Much

parallel reading is required. In a general way Minto's plan of study is followed. Two periods, third term. Required of Juniors. Two periods, first and second terms. Required of Seniors. Professor HILL.

HISTORY.

189. Ancient and Modern History.—The student, by means of text-book and informal lectures, is introduced to the leading facts in the world's history, and to the significance and consequences of these facts. While historic sequence is carefully noted, the student follows, as far as possible, the topical method. Two periods. Required of all Freshmen. Professor PHELPS.

190. English History.—The first term of the Junior year is devoted to the study of English History. The text is supplemented by lectures on important periods. Two periods, first and second terms. Required of Juniors. Professor HILL.

POLITICAL ECONOMY.

191. Political Economy.—This course deals with public problems relating to the production, distribution, and exchange of wealth. The leading topics discussed are capital, wages, money, transportation, and taxation. Instruction is given by lectures and text-books. Required of Seniors. Two periods. President WINSTON.

MILITARY SCIENCE.

192. Drill.—Schools of the Soldier, Company, and Battalion in Close and Extended Order; Ceremonies; Marches and Minor Tactics. United States Infantry Drill Regulations. Three hours in the afternoon. Required of all classes. Commandant and officers of the Battalion.

193. Tactics.—Theoretical instruction in the Schools of the Soldier, Company and Battalion in Close and Extended Order; Ceremonies, etc. One period. Required of all Juniors. Captain PHELPS.

TEXTILE COURSES.

- VII. The Four Year Course in Textile Industry.
- VIIa. The Two Year Course in Textile Industry.
- VIIb. The Two Year Course in Dyeing.

THE COURSES IN TEXTILE INDUSTRY.

The Department of Textile Industry is located in the new building completed during the present session for its use. The work of instruction carried on there is a combination of practice and theory in the manufacture of various grades of cotton goods, such as yarns, plain and fancy cloths. The student is taught to perform all the operations in connection with the manufacture of these goods, from the bale of cotton to the finished cloth. He learns how to operate the different machines and how to change them so as to produce the desired results. Instruction is also given in some of the larger problems connected with the industry. The building is fitted up like a small cotton mill and the work is conducted according to the practical methods in use there. The object of all the instruction is to prepare the student for a useful career in the cotton manufacturing industry. Some of the graduates are overseers, some are dyers, while others are superintendents of cotton mills, the position which each has attained depending upon his ability to deal with manufacturing problems.

In this department two courses of instruction are offered, the Full Course, leading to the degree of Bachelor of Engineering, and the Short Course. The Full Course covers a period of four years and combines with the textile instruction certain practical and theoretical subjects which enable the student to understand better his special work. The textile instruction begins in the Sophomore year and is the principal work of the Junior and Senior years. The Short Course is offered to those mature students who cannot spend the time required for the Full Course. To be successful the student should have had a good preparation in his early studies, especially in mathematics, and some practical experience. To enter this course the student is required to pass the full entrance examinations for the Freshman Class in College and must satisfy the professor in charge of his ability to go on with the work. Combined with the textile instruction are certain practical subjects which aim to increase the skill of the student.

In addition to the instruction given in the Textile Building, the courses in physics and chemistry, with the well equipped laboratories of these departments, in mechanical engineering subjects, with the shops and drawing-rooms in the Mechanical Building, in Mathematics and English, are all open to students in Textile Industry.

Some small tools are needed to perform the work in this department, also supplies for designing, consisting of paper, paint and brushes. The student will obtain these in the Textile Building. To cover the cost of same, a deposit of \$5 is required. Any part of this remaining over at the end of the year is returned.

VII. The Four Year Course in Textile Industry, leading to the degree of Bachelor of Engineering.

Freshman Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Free-hand Drawing, 206 -----	2	--	--
Mechanical Drawing, 207 -----	--	2	2
Wood work, 209 -----	1	1	1
Forge-work, 210 -----	1	1	1
Mechanical Technology, 214 -----	1	1	1
Algebra, 220 -----	4	4	--
Geometry, 221 -----	--	--	4
Book-keeping, 223 -----	1	1	1
Elementary Physics, 217 -----	2	2	2
English, 224 -----	3	3	3
History, 229 -----	2	2	2
Military Drill, 232 -----	3	3	3

Sophomore Year.

Carding and Spinning, 194 -----	1	1	1
Mechanical Drawing, 208 -----	2	2	2
Elementary Machinists' Work, 213 -----	1	1	1
Electricity and Magnetism, 218 -----	2	2	2
Geometry, 221 -----	4	--	--
Trigonometry, 222 -----	--	4	4
Inorganic Chemistry, 201 -----	3	3	3
Inorganic Chemistry (laboratory), 202 -----	2	2	2
English, 225 and 227 -----	2	2	2
Military Drill, 232 -----	3	3	3

Junior Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Carding and Spinning, 194-----	3½	3½	3½
Weaving, 195-----	3½	3½	3½
Textile Designing, 196-----	2	2	2
Textile Chemistry and Dyeing, 197-----	2	2	2
Textile Chemistry and Dyeing (lab'y), 198,-----	2	2	2
Dynamo Machinery, 219-----	2	2	2
English and History, 230 and 228-----	2	2	2
Military Tactics, 233-----	1	1	1
Military Drill, 232-----	3	3	3

Senior Year.

Carding and Spinning, 194-----	4	4	4
Weaving, 195-----	4	4	4
Textile Designing, 196-----	3	3	3
Steam-engine, 216-----	2	2	2
English, 228 and 226-----	2	2	2
Political Economy, 231-----	2	2	2
Military Drill, 232-----	3	3	3

VIIb. The Two Year Course in Textile Industry.

First Year.

Carding and Spinning, 194-----	3½	3½	3½
Weaving, 195-----	3½	3½	3½
Textile Designing, 196-----	2	2	2
Free-hand Drawing, 206-----	2	--	--
Mechanical Drawing, 207-----	--	2	2
Wood-work, 209-----	1	1	1
Forge-work, 210-----	1	1	1
Mechanical Technology, 214-----	1	1	1
English, 224-----	3	3	3
Military Drill, 232-----	3	3	3

Second Year.

SUBJECTS.	PERIODS PER WEEK.		
	1st Term.	2d Term.	3d Term.
Carding and Spinning, 194.....	4	4	4
Weaving, 195.....	4	4	4
Textile Designing, 196.....	3	3	3
Mechanical Drawing, 208.....	2	2	2
Forge-work, 211.....	1	--	--
Pattern-making, 212.....	--	1	1
Mechanical Processes, 215.....	1	1	1
English, 225 and 227.....	2	2	2
Military Drill, 232.....	3	3	3

THE TWO YEAR COURSE IN DYEING.

This course is established primarily for the benefit of young men who have had practical experience in dyeing, and who desire to obtain a knowledge of the fundamental principles of chemistry, and of dyeing, upon which their work is based. The work is intended to give the student such a grasp of the subject that he will be able to test new dyes and mordants, and introduce new methods and new processes as they are needed, or are devised. It is believed that any practical dyer can spend two years with considerable profit to himself at this College, if he has not already had training in chemistry and the principles of dyeing.

VIIb. The Two Year Course in Dyeing.

First Year.

Inorganic Chemistry, 201.....	3	3	3
Inorganic Chemistry (laboratory), 202.....	2	2	2
Textile Chemistry and Dyeing, 197.....	2	2	2
Textile Chemistry and Dyeing (lab.), 198.....	2	2	2
Physics, 217.....	2	2	2
Algebra, 220.....	4	4	--
Geometry, 221.....	--	--	4
English, 224.....	3	3	3
Military Drill, 232.....	3	3	3

Second Year.

SUBJECTS.	PERIODS PER WRRK.		
	1st Term.	2d Term.	3d Term.
Dyeing, 199	2	2	2
Dyeing (laboratory), 200	4	4	4
Organic Chemistry, 203	2	2	2
Analytical Methods, 204	1	1	1
Analytical Chemistry (laboratory), 205	2	2	2
Geometry, 221	4	—	—
Trigonometry, 222	—	4	4
English, 225, 224	2	2	2
Military Drill, 232	3	3	3

TEXTILE BUILDING AND EQUIPMENT.

The Textile Building is located on the west campus, just beyond the Horticultural Building. It is a two-story brick building 125 x 75 feet, with a basement, erected from the plans of The D. A. Tompkins Co., Charlotte, N. C. Throughout its construction is similar to a cotton mill, being an illustration of standard construction in this class of buildings. The basement is fitted up with a laboratory and class-room for instruction in dyeing and will be further equipped as a dye-house. 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 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. The following is a list of the machines and their makers:

Carding Department.

Opening-room.—One combination opener and breaker lapper, made by Kitson Machine Co., Lowell, Mass. One 40-inch single beater finisher lapper, with patent carding beater, made by Kitson Machine Co., Lowell, Mass.

Carding-room.—One 40-inch revolving flat card, 110 flats, with coiler, made by Mason Machine Works, Taunton, Mass. One 40-inch revolving flat card, 110 flats, with coiler, made by Whitin Machine

Works, Whitinsville, Mass. One 40-inch revolving flat card, 110 flats, with coiler, made by Saco and Pettee Machine Shops, Newton Upper Falls, Mass. One single railway head, with coiler, 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 coiler, metallic rolls and improved evener motion, made by Saco and Pettee Machine Shops, Newton Upper Falls, Mass. One drawing frame, four deliveries, metallic rolls, made by Saco and Pettee Machine Shops, Newton Upper Falls, Mass. One 36-spindle slubber for 11x5½-inch bobbin, with ball-bearing top rolls, made by Woonsocket Machine and Press Co., Woonsocket, R. I. One 48-spindle intermediate roving frame for 9x4½-inch bobbin, made by Saco and Pettee Machine Shops, Biddeford, Me. One 64-spindle fine roving frame for 7x3½-inch bobbin, with ball-bearing top rolls, made by Woonsocket Machine and Press Co., Woonsocket, R. I. One 80-spindle jack roving frame for 6x2½-inch bobbin, with ball-bearing top rolls, made by Woonsocket Machine and Press Co., 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 Co., Pawtucket, R. I. One 72-spindle spinning frame for warp; one 80-spindle spinning frame for filling, made by Saco & Pettee Machine Shops, Biddeford, Me.

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 48-spindle twister, made by Whitin Machine Works, Whitinsville, Mass. One 72-spindle twister, one-half for wet, one-half for dry twisting, made by Draper Company, Hopedale, Mass. One 48-spindle twister, one-half for wet, one-half for dry twisting, made by Fales & Jenks Machine Co., Pawtucket, R. I. One 50-spindle reel, one-half live, one-half dead spindles, made by D. A. Tompkins Co., Charlotte, N. C. One 6-spindle universal winding machine, made by Universal Wind-

ing Co., Boston, Mass. One 12-spindle bobbin winding machine, made by W. W. Altemus & Son, Philadelphia, Pa.

Weaving Department.

Warp Preparation.—One section warper, 400 ends, made by Draper Company, Hopedale, Mass. One beaming machine, made by Lewiston Machine Co., Lewiston, Me.

Looms.—One Northrop-Draper print cloth loom; one Northrop-Draper sateen loom, made by Draper Company, Hopedale, Mass. One high-speed loom, made by Kilburn & Lincoln, Fall River, Mass. One sheeting loom; one side cam loom, made by Whitin Machine Works, Whitinsville, Mass. One print cloth loom; one sheeting loom; one 2x1 box loom; one 24-harness dobby loom, made by Mason Machine Works, Taunton, Mass. One Crompton 4x1 box gingham loom; one Crompton 4x1 box loom, with 20-harness dobby; one Crompton single box loom, with 400 hook Jacquard head; one Knowles Gem loom, 4x4 box; one Stafford single box loom, with 20-harness dobby, made by Crompton & Knowles Loom Works, Worcester, Mass.

Dyeing Department.

The laboratory instruction in dyeing has been given hitherto in the Chemical Laboratory in the Main Building. The department has a collection of about a thousand samples of dyes, a large number of sample cards, and all the important books on dyeing. Samples of new dyes are usually received as they are placed on the market by the dealers. Quarters for instruction in dyeing have been provided in the Textile Building, recently constructed, consisting of a large dye-house 70x50 feet, a dyeing laboratory 32x25 feet, a lecture-room, an office, and a store-room. It is expected that these rooms will be fully equipped by the opening of the College in September.

Power Installation.

One switch-board, made by D. A. Tompkins Co., Charlotte, N. C. One 10-horse-power S. K. C. induction motor, made by Stanley Electric and Manufacturing Co., Pittsfield, Mass. One 10-horse-power induction motor; one 15-horse-power induction motor, made by Westinghouse Electric and Manufacturing Co., Pittsburg, Pa. Pulleys, shafting, hangers and couplings, made by Jones & Laughlins, Pittsburg, Pa.

Description of Subjects.

194. 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 lappers; cards; railway-heads; drawing-frames; slubbers; intermediates; speeders; jacks. Ring spinning-frames and mules. Spoolers and warpers. 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. Required of Sophomores, Juniors and Seniors in the full course and of first and second-year students in the short course. Professor WILSON.

195. Weaving.—Lectures and recitations; practice in operating and fixing looms, warp preparation, cloth-room and finishing machinery. Preparing warps for the looms; pin frame warpers, section warpers, beam warpers. Sizing, size vats, slasher. Drawing-in and reeding. Weaving; hand and power looms. Construction of plain loom, principal movements in weaving; cams and their construction. Auxiliary movements. Drop box motion; chain building for box looms, multipliers, setting and timing of box motions. Dobby; single and double action, negative and positive head motions, dobbies with extra appliances necessary for weaving lenos; towel and other pile fabrics. Jacquard; construction and tie up. Finishing; gray goods and colored cottons. Folding and packing for the market. Required of Juniors and Seniors in the full course and of first and second-year students in the short course. Mr. NELSON.

196. Textile Designing.—Lectures and practice in design construction and cloth analysis. Foundation weaves; derivative weaves. Design paper; methods of representing weaves on paper. Combination of weaves; figured weaving on plain ground. Construction of satin cloth; construction of checked cloth. Color and color effects. Weaves of a peculiar character. Bedford cords, piqués. Cloths backed with filling; cloths backed with warp. Double cloths. Figuring with extra warp; figuring with extra filling. Leno with one or more sets of doups. Methods of obtaining leno patterns. Jacquards. Distribution and setting out of figures for geometrical and floral effects. Analysis of stripes, checks, and fancy cloths. Calculating particulars of cloth from data ascertained from sample.

Calculations to obtain quantities of warp and filling in stripe and check fabrics; for shrinkage or contraction; ply yarns; to find number of thread per inch using a given weight of warp; also number of picks per inch using a given weight of filling. Reed and harness calculations. Methods of representing harness and reed drafts. Construction of cloth. Balance of cloth. Required of Juniors and Seniors in the full course, and of first and second-year students in the short course. Mr. NELSON.

DYEING.

197. Textile Chemistry and Dyeing.—Lectures. A study of the chemistry of the textile fibers, and the principles involved in bleaching, dyeing, and printing. The student becomes acquainted with methods and machinery for dyeing cotton, wool, silk, and mixed goods, and learns the most important dyes now in use. Two periods. Required of Juniors. Doctor FRAPS.

198. Textile Chemistry and Dyeing.—Laboratory work. The experiments are designed to accompany Course 197. Working with small skeins of yarns, the student learns different methods of dyeing, applies a number of dyes, tests their fastness to washing, and other agencies, and applies other tests. All dyed skeins and fastness tests are entered in suitable scrap-books. Two periods. Required of Juniors. Doctor FRAPS.

199. Dyeing.—Lectures. A further study of the properties and modes of application of dye-stuffs and mordants, especially those applied to cotton. Detailed study is made of certain important methods of dyeing cotton, as indigo, turkey red, aniline black, etc. Two periods. For second-year students in the Two Year Course in Dyeing.

200. Dyeing Laboratory.—Involves the bleaching and dyeing of cotton in the dye-house, dyeing to a given shade, mixing of dyes, and practical dye-tests. The student learns how to study a new dye and devise methods for its practical application. Four periods. For second-year students in the Two Year Course in Dyeing.

CHEMISTRY.*

201. Inorganic Chemistry.—Remsen's *Introduction to the Study 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. Three periods. Required of Sophomores. Professor WITHERS and Doctor FRAPS.

* For further information see Courses in Industrial Chemistry.

202. Inorganic Chemistry.—Laboratory work. Reimsen and Randall's *Laboratory Guide*. The student performs, under the eye of the instructor, experiments designed to illustrate and emphasize the work of the class-room. He records in a note-book his observations and the conclusions drawn from them. Two periods. Required of Sophomores. Mr. SYME.

203. Organic Chemistry.—Reimsen's *Introduction to the Study of Compounds of Carbon*. The fundamental principles of organic chemistry and the more important compounds are studied. Two periods. For second-year students in the Two Year Course in Dyeing. Mr. BIZZELL.

204. Analytical Methods.—A discussion of methods and principles involved in qualitative and quantitative analysis. One period. For second-year students in the Two Year Course in Dyeing. Mr. BIZZELL.

205. Analytical Chemistry (Introductory).—Laboratory work. Caldwell's *Chemical Analysis*. The student is taught to detect the presence of the more common elements in unknown substances. He is given practice in introductory gravimetric and volumetric quantitative work. Two periods. For second-year students in the Two Year Course in Dyeing. Mr. SYME.

MECHANICAL ENGINEERING.*

206. Free-hand Drawing.—Work in the use of the pencil; isometric sketches; technical sketches of objects, usually parts of a machine. Two periods, first term. Required of Freshmen and first-year students. Mr. CHITTENDEN.

207. Elementary Mechanical Drawing.—Use of instruments; geometric drawing; isometric drawing; elementary projections; drawings made to scale from working sketches of pieces of a machine. Two periods, second and third terms. Required of Freshmen and first-year students. Mr. CHITTENDEN.

208. Mechanical Drawing.—Working sketches and drawing machine parts from the model; tracing and blue-printing; elementary machine design. Two periods. Required of Sophomores. Mr. CHITTENDEN.

209. Wood-work.—Use of bench tools; working from drawings, lining, sawing, planing; practice in making simple exercises in wood-turning; handling of wood-lathes and tools. One period. Required of Freshmen. Mr. BRAGG and Mr. CARTER.

* For full information see Course in Mechanical Engineering.

210. Forge-work.—Exercises in working with iron, welding; uses and care of forge-tools and fires. One period. Required of Freshmen. Mr. OLIVER CARTER.

211. Forge-work.—Exercises in working with steel; tempering; case-hardening. One period. Required of second-year students. Mr. OLIVER CARTER.

212. Pattern-making.—Exercises in making patterns, generally of machine parts. One period, second and third terms. Required of second-year students. Mr. BRAGG and Mr. CARTER.

213. Machinists' Work.—Bench and machine-work; exercises in chipping and filing; exercises in lathe-work, boring, reaming, drilling, planing, milling, and shaper-work. One period. Required of Sophomores. Mr. PARK.

214. Mechanical Technology.—Classification and uses of wood-working and forging-tools and machines; principles of correct methods of wood-working and forging; care of belting and shafting. One period. Required of Freshmen. Mr. CARTER.

215. Mechanical Processes.—Description of machines used in engineering-work; methods of pattern-making; moulding, casting and heavy forging; description of various machine tools and methods of performing work on them; boiler-making and plate-work. One period. Required of second-year students. Professor DICK.

216. Steam-engine.—Descriptive study of the simple steam-engine; names and uses of the various parts of an engine; various types of engines and fittings, foundations and pipings; different types of boilers and setting; arrangement of power plants; care of engines and boilers. Two periods. Required of Seniors. Professor DICK.

PHYSICS.*

217. 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 the study of light. Two periods. Required of Freshmen. Professor WEIHE.

218. Elementary Lessons in Electricity and Magnetism.—Two periods. Required of Sophomores. Professor WEIHE.

ELECTRICAL ENGINEERING.

219. Dynamo Machinery.—Dynamo-electric machines. Dynamos and motors. Efficiency. Characteristic curves. Two periods. Required of Juniors. Professor WEIHE and Mr. WALTER.

*For full information see Course in Electrical Engineering.

MATHEMATICS.*

220. Advanced Algebra.—Begins at quadratic equations; general theory of equations; solution of higher equations, etc. Wells's *Higher Algebra*. Four periods, first and second terms. Required of Freshmen. Mr. YATES and Mr. FISH.

221. Geometry.—Plane and solid. Wentworth's *Plane and Solid Geometry*. Four periods, third term. Required of Freshmen. Four periods, first term. Required of Sophomores. Mr. YATES.

222. Trigonometry.—Four hours, second and third terms. Required of Sophomores. Mr. YATES.

223. Book-keeping.—The work of the text-books supplemented by numerous original examples and sets for practice. One period. Required of Freshmen. Mr. YATES.

ENGLISH.

224. Introductory Rhetoric and Composition.—Scott & Denney's *Composition Rhetoric* and Buehler's *Exercises* are used as texts. These are accompanied by drills on the forms of the language and methods of sentence formation. The student is taught to plan all work, and every effort is made to develop his constructive faculties. Three periods. Required of all Freshmen. Professor HILL and Mr. OWEN.

225. Rhetoric.—Newcomer's *Rhetoric*. The organic parts of discourse and the essential qualities of good style are considered. Especial study is given this year to themes in narration and description. Many exercises are required. Required of all Sophomores. Two periods, first and second terms. Professor HILL.

226. Analysis and Construction of Themes in Exposition and Argumentation.—Two periods, third term. Required of all Seniors. Professor HILL.

227. American Literature.—By means of an introductory text and by much reading students are introduced to what is best in the literature of their own country. Books are studied at first hand. Synopses, paraphrases, and critiques required. Two periods, third term. Professor HILL.

228. English Literature.—The development of English Literature through its great periods and through its representative men. Much parallel reading is required. In a general way Minto's plan of study is followed. Two periods, third term. Required of Juniors. Two

*For full information see Course in Civil Engineering.

periods, first and second terms. Required of Seniors. Professor HILL.

HISTORY.

229. Ancient and Modern History.—The student, by means of text-book and informal lectures, is introduced to the leading facts in the world's history, and to the significance and consequences of these facts. While historic sequence is carefully noted, the student follows, as far as possible, the topical method. Two periods. Required of all Freshmen. Professor PHELPS.

230. English History.—The first term of the Junior year is devoted to a study of English history. The text is supplemented by lectures on important periods. Two periods, first and second terms. Required of all Juniors. Professor HILL.

POLITICAL ECONOMY.

231. Political Economy.—This course deals with public problems relating to the production, distribution, and exchange of wealth. The leading topics discussed are capital, wages, money, transportation, and taxation. Instruction is given by lectures and text-books. Two periods. Required of Seniors. President WINSTON.

MILITARY SCIENCE.

232. Drill.—Schools of the Soldier, Company, and Battalion in Close and Extended Order; Ceremonies; Marches and Minor Tactics. United States Infantry Drill Regulations. Three hours in the afternoon. Required of all classes. Commandant and officers of the Battalion.

233. Tactics.—Theoretical instruction in the Schools of the Soldier, Company, and Battalion in Close and Extended Order; Ceremonies, etc. One period. Required of all Juniors. Captain PHELPS.

DONATIONS.

The College makes thankful acknowledgment of the receipt of the following gifts during the year:

To the Department of Agriculture.

Acme Harrow Company, Millington, N. J.—Acme pulverizing harrow.

John Deere & Co., Moline, Ill.—One disc plow.

Chattanooga Plow Company, Chattanooga, Tenn.—One two-horse turning plow.

Bucher & Gibbs Company, Canton, O.—One two-horse turning plow.

D. M. Osborne & Co., Charlotte, N. C.—One two-horse mowing machine.

B. F. Avery & Co., Louisville, Ky.—One two-horse corn planter and check rower, one one-horse corn planter and one two-horse cultivator with spring-tooth attachment.

Cornell Incubator Company, New York, N. Y.—Four incubators and brooders.

Star Incubator and Brooder Company, Roundbrook, N. J.—One incubator and brooder.

Cornell Incubator Company—Four incubators and four brooders.

Star Incubator and Brooder Company—One incubator and one brooder.

McCormick Harvester Company—One mower, one harvester, one rake, one corn harvester, and one corn shredder.

To the Department of Biology.

Dr. Frank Lincoln Stevens—Between five hundred and seven hundred herbarium specimens of plants native to North Carolina.

To the Department of Chemistry.

Ada Manufacturing Company, Charlotte, N. C. (through David Clark, Secretary and Treasurer)—25 pounds cotton yarn.

Berlin Aniline Works, New York—6 four-ounce bottles of dyes.

J. A. and W. Bird, Philadelphia, Pa.—24 four-ounce bottles of dyes and chemicals.

Carborundum Company, Niagara Falls, N. Y.—Samples of coke, spar, sand, and clay, from which carborundum is made, and seven samples of finished products.

Conda Color Company, New York—4 two-ounce bottles of dyes.

Dyers' Bulletin, Philadelphia—Dyers' Bulletin.

Dyers' Trade Journal, Philadelphia—Dyers' Trade Journal.

Farbenfabriken of Elberfeld Co., New York—26 four-ounce bottles of dyes.

John J. Keeler & Co., New York—Collection of shade cards.

Klipstein & Co., New York—Collection of shade cards.

Schoelkopf, Hartford and Hanna Company, Buffalo, N. Y.—39 eight-ounce bottles of dyes.

Sybes & Street, New York—2 samples of dyes.

To the Department of Textile Industry.

Whitin Machine Works, Whitinsville, Mass. (through Stuart W. Cramer, Southern Agent, Charlotte, N. C.)—One 40-inch revolving flat card; one 4-delivery drawing frame; one 80-spindle spinning frame; one side cam loom.

Saco and Pettet Machine Shops, Biddeford, Me. (through A. H. Washburn, Southern Agent, Charlotte, N. C.)—One 48-spindle intermediate roving frame; one 72-spindle spinning frame; one 80-spindle spinning frame.

Kitson Machine Company, Lowell, Mass. (through Stuart W. Cramer, Charlotte, N. C.)—One combination opener and breaker lapper; one 40-inch finisher lapper.

Mason Machine Works, Taunton, Mass. (through D. A. Tompkins Company, Charlotte, N. C.)—One 40-inch revolving flat card; two 80-spindle spinning frame; one print cloth loom; one plain loom; one 2x1 box loom; one 24-harness dobby loom.

Woonsocket Machine and Press Company, Woonsocket, R. I. (through Stuart W. Cramer, Southern Agent, Charlotte, N. C.)—One 36-spindle slubber; one 64-spindle fine roving frame; one 80-spindle jack roving frame.

Files and Jenks Machine Company, Pawtucket, R. I. (through O. A. Robbins, Charlotte, N. C.)—Two 80-spindle spinning frames; one 48-spindle wet and dry twister.

Easton and Burnham Machine Company, Pawtucket, R. I. (through O. A. Robbins, Charlotte, N. C.)—One 32-spindle spooler.

W. W. Altamus & Son, Philadelphia, Pa.—One 12-spindle bobbin winding machine.

Crompton and Knowles Loom Works, Worcester, Mass.—Reduction on prices of looms.

D. A. Tompkins Company, Charlotte, N. C.—One switchboard.

Jones & Laughlins, Pittsburg, Pa.—Equipment of shafting, hangers, pulleys, and couplings.

Fayweather & Loden, New York City.—Hoyt's belting.

Maloney-Bennett Belting Company, Chicago.—Belting.

Leonard & Ellis, Charlotte, N. C.—Lubricating oils.

Courtesies Extended.

Textile Excelsior, Charlotte, N. C.

Textile Manufacturers' Journal, New York City.

Fiber & Fabric, Boston, Mass.

Manufacturers' Record, Baltimore, Md.

Pilot Cotton Mills, Raleigh, N. C.

Caraleigh Cotton Mills, Raleigh, N. C.

To the Library.

J. O. Carr, Wilmington, N. C.—"The Dickson Letters," edited by the donor.

P. C. Ennis, Raleigh, N. C.—Several volumes of Reports of the U. S. Department of Agriculture.

G. S. Praps, Raleigh, N. C.—"The Life and Death of Richard Yea and Nay," by Maurice Hewlett.

W. L. R. Gifford, Cambridge, Mass.—"Haverhill's Memorial of J. G. Whittier."

D. H. Hill, Raleigh, N. C.—"The Old Plantation," by J. B. Avirett; "John Vytal," by W. F. Payson.

Rev. A. B. King, New York, N. Y.—"The Purple and Scarlet Woman," by the donor.

John S. Pierson, New York, N. Y.—"Day-break in Livingstonia," by J. W. Jack; "James Hannington," by F. C. Dawson; "Thomas Birch Freeman," by John Milum; "The Cobra's Den," by Rev. J. Chamberlain; "In the Tiger Jungle," by Rev. J. Chamberlain; "From Far Formosa," by G. L. Mackay; "Pilkington of Uganda," by C. F. Hartford—Battersby; "Martyred Missionaries of China Inland Mission"; "Chinese Characteristics," by A. H. Smith; "James Obalmers," by William Robeson; "John Williams," by Rev. J. J. Ellis; "Medical Missions," by S. W. Muir; "James Gilmour of Mongolia," by Richard Lovett; "Korea and Her Neighbors," by I. B. Bishop; "The

Congo for Christ," by J. B. Myers; "Pandita Ramabai," by H. S. Dyer; "Persian Life and Customs," by Rev. S. G. Wilson; "While Sewing Sandals," by E. Ranschenbusch-Clough; "The Wrongs of Indian Womanhood," by Mrs. M. B. Fuller; "Kilpatrick and Our Cavalry," by James Moore; "Bessie and Raymond"; "Within the Purdah," by S. Armstrong-Hopkins; "Records of the 24th Independent Battery," by J. W. Merrill; "Mission Problems and Mission Methods," by J. C. Gibson; "The Bishop's Conversion," by E. B. Maxwell; "John G. Patton, Missionary to the New Hebrides"; "Life in Hawaii," by Titus Coan; "A Life for Africa," by E. C. Parsons; "Arabia, the Cradle of Islam," by Rev. S. M. Zwemer; "The Twenty-seventh, a Regimental History," by W. D. Sheldon; "Hail Columbia, The Flag," etc., by W. T. Saffell; "China's Only Hope," by S. I. Woodbridge; "Bishop Patterson, the Martyr of Melanesia," by Jesse Page; "The Child of the Ganges," by R. N. Barrett; "The Siege in Peking," by W. A. P. Martin; "Ecumenical Missionary Conference," vols. 1 and 2; "The Transformation of Hawaii," by B. M. Brain; "Story of the Life of Mackay of Uganda," by his Sister; "Missionary Readings," etc., by B. M. Bain; "With the Tibetans in Tent and Temple," by S. C. Rijnhart; "The Evolution of a Life," by Seth Eyland; "The Apostle of the North, Rev. James Evans," by E. R. Young; "The Students' Challenge to the Churches," by L. D. Wishard; "Black Rock," by Ralph Connor.

G. T. Winston, Raleigh, N. C.—"America's Race Problems"; "Pestalozzi and the Foundation of the Modern Elementary School," by A. Pinloche.

Mrs. G. T. Winston, Raleigh, N. C.—"The Market Place," by Harold Frederick.

Lewis T. Winston, Raleigh, N. C.—"Dick and Jack's Adventures on Sable Island," by B. F. Ashley; "The Pioneers," "The Prairie," "The Last of the Mohicans," "The Pathfinder," "The Deerslayer," by James Fenimore Cooper; "The Flamingo Feather," by Kirk Munro.

Stuart W. Cramer, Charlotte, N. C.—"The Metallurgy of Steel," vol. 1, by H. M. Howe; "Metallic Wealth of the United States," by J. D. Whitney; "Report of the Mineral Resources," by J. Ross Browne and J. W. Taylor; "Resources of the Pacific Slope," by J. Ross Browne; "Mining Statistics West of the Rocky Mountains," by R. W. Raymond; "Mining Reports," by R. W. Raymond; "Mines and Mining West of the Rocky Mountains," by R. W. Raymond (5 vols.); "Production of Gold and Silver" (19 vols.); "Precious Metals in the

United States," by Leech (4 vols.); "Transactions American Institute Mining Engineers," 1889-1899 (12 vols.); "The Mineral Industry," by R. P. Rothwell, 1892-'93 (2 vols.); "Reports of the United States Geological Survey," 1883, 1888-1893 (7 vols.); "Mineral Resources of the United States," 1883, 1888-1893, and 1900 (8 vols.); "Report of the Director of The Mint," 1889-1892 (4 vols.).

F. O. Moring, Raleigh, N. C.—"Finishing of White, Dyed, and Printed Cotton Goods," by Joseph Depierre.

1891-1902

1904

CATALOGUE OF STUDENTS.

GRADUATES.

<i>Name.</i>	<i>Post-office.</i>	<i>Major Course.</i>
WILLIAM ANDERSON SYME, B. S. '99.	Raleigh,	Chemistry.
WILLIAM FRANKLIN PATE, B. S. '01.	Snow Hill,	Chemistry.

SENIOR CLASS. 14

<i>Name.</i>	<i>Post-office.</i>	<i>Course.</i>
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JUNIUS SIDNEY CATES,	Swepsonville,	Agr.
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JUNIUS FRANKLIN DIGGS,	Diggs,	Ch. and D.

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<i>Name.</i>	<i>Post-office.</i>	<i>Course.</i>
ARTHUR TEMPLETON KENYON, ✓	Clinton,	C. E.
WILLIAM THOMAS KNIGHT, JR.,	Tarboro,	E. E.
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DANIEL CHARLES SWINDELL, ✓	Raleigh,	E. E.
JAMES EUDY THEIM, ✓ ✓	Raleigh,	E. E.
WILLIAM MERRIMAN UPCHURCH,	Morrisville,	M. E.
KENNETH CLYDE WAGSTAFF,	Winstead,	Mch. Shop.
MOSES ALBERT WALKER, JR.,	Winston,	Agr.
STEPHEN DOCKERY WALL, ✓	Rockingham,	M. E.
CHARLES MANLY WALTON, ✓	Morganton,	C. E.
RALPH OURAY WALTON, ✓	Morganton,	M. E.
WALTER WELLINGTON WATT, ✓	Nimrod,	Tex.
SAMUEL TURNER WHITE,	Warrenton,	M. E.
THOMAS WILSON WHITE,	Asheville,	E. E.
GEORGE LLRWELLYN WHITLEY,	Williamston,	C. E.
FRANKLIN LEROY WILSON,	Lowell,	Tex.
JOHN ENOCH WILLIAMS,	Cades,	E. E.
PAUL PRESTON YATES,	Williams Mill,	Tex.

SHORT COURSE STUDENTS.

Second Year. 17

ARTHUR LESLIE BLACKWELL, ✓	Darlington, S. C.,	M. A.
ELIAS CARR CARRAWAY, ✓	Kinston,	Tex.
HENRY BROZIER CARTWRIGHT, ✓	Elizabeth City,	M. A.
DICKSON SLOAN CROMARTIE, ✓	Garland,	Agr.
WILLIAM FLETCHER DAILEY, ✓	Burlington,	M. A.
ROBERT ISAAC DALTON,	Winston-Salem,	Tex.
HARMAN EDWARD GRIMSLEY,	Snow Hill,	M. A.
EDWARD SOLON HOGGARD,	Windsor,	Tex.
AUGUSTUS PRITCHARD HOWARD,	Salemburg,	Agr.
LEROY ISLER,	Goldsboro,	Tex.
LEONIDAS JOYNER,	Bunyon,	Agr.
JOHN KENNETH MCFADYEN,	Cameron,	M. A.
PLEASANT HENDERSON POINDEXTER,	Donnoha,	M. A.
JULIUS MARION SPEAS,	Boonville,	Agr.
SIDNEY SIMS STEVENSON,	Shawboro,	M. A.
RAY M. SUMMEY,	Dallas,	M. A.
ALBERT CLINTON WHARTON, JR.,	Clemmons ville,	Agr.

First Year. 93

<i>Name.</i>	<i>Post-office.</i>	<i>Course.</i>
JOSEPH L. ABERNETHY,	Hickory,	Agr.
LEROY FRANKLIN ABERNETHY, ✓	Hickory,	Agr.
JAMES CALVIN ALEXANDER,	Newell,	Agr.
FRED ANDERSON,	Sparkling Cataw. Spgs.	Agr.
CLBON MITCHENOR AUSTIN,	Clayton,	Agr.
ROBERT LUTHER BARNES,	Taylor,	M. A.
ZADOK KEMSTED BASDEN,	Richlands,	M. A.
JAMES CLAUDIUS BEAVERS,	Morrisville,	Agr.
CLOVAS McDONALD BLACK,	Kinston,	Tex.
JOHN KOONCE BROCK,	Trenton,	Agr.
WILLIAM FRANCIS BROCK,	Farmington,	M. A.
ARCHIE BROWN,	Fayetteville,	M. A.
ARHBIBALD ALEXANDER BROWN,	Elfland,	M. A.
CHARLES MALCOM BUIE,	Angle,	M. A.
JOHN DUNHAM BUNDY,	Monroe,	M. A.
PAUL ALLEN BURNS,	Cedar Hill,	M. A.
WILLIAM ANDERS BUYS, ✓	Havelock,	Agr.
DAVID THOMAS CHAMBERS,	Pearsall,	Agr.
SAMUEL HERBERT CLARKE,	Statesville,	M. A.
EDWARD CLIFTON CLINARD,	Hickory,	M. A.
GUY ELLIS CLINE,	Lincolnton,	M. A.
JOHN WILBORNE COLETRANE,	Liberty,	M. A.
JACK GREEN COPELAND,	Fremont,	M. A.
WILLIAM EDWARD CUNNINGHAM,	Fletcher,	M. A.
PERCY IVANS DARDEN,	Goldsboro,	M. A.
PINCKNEY GUSTAVUS DEAL,	Asheville,	M. A.
CICERO HORACE DURHAM,	Dallas,	Tex.
EDGAR VIVIAN EDENS,	Rowland,	M. A.
JAMES BECKET EWART, ✓	Hendersonville,	M. A.
JOHN JAMES FERGUSON, ✓	Neuse,	M. A.
SAMUEL MORGAN FISHER,	Lake Landing,	Agr.
SHIRLY WATSON FOSTER, ✓	Nance,	Agr.
BEN FRANK GARDNER,	Hunts,	M. A.
JESSE WATERS GARRETT,	Charlotte,	M. A.
CHARLES JUDSON BEVERLY GAYLE,	Raleigh,	M. A.
THOMAS J. GEORGE,	Francisco,	Agr.
RICHARD PARKS GIBBON,	Derita,	M. A.
MAURICE VAUGHAN GRIFFIN,	Elizabeth City,	M. A.

<i>Name.</i>	<i>Post-office.</i>	<i>Course.</i>
CHARLES MARION HAMILTON,	Charlotte,	M. A.
GEORGE PARISH HAMILTON,	Charlotte,	M. A.
HORACE LESTER HAMILTON, ✓	Biltmore,	M. A.
WILLIAM SHAKESPEARE HARRIS, ✓	Mebane,	M. A.
CLARENCE CARL HARRELL,	Hamilton,	Agr.
WILBUR HARRISON,	Waynesville,	M. A.
HOMER HAAR HAWES,	Atkinson,	M. A.
THOMAS CARL HINKLE,	Lexington,	M. A.
WESCOM HENRY HOSKINS,	High Point,	M. A.
WILLIAM ARTHUR HYATT, ✓	Waynesville,	Agr.
HENRY REGINALD KNIGHT,	Barnes Store,	M. A.
ARTHUR LEACH,	Candor,	Agr.
CLYDE OSCAR LONG,	Cliffdale,	Agr.
CLARENCE LYTCH,	Laurinburg,	Agr.
THOMAS OSCAR McEWEN,	Monroe,	M. A.
MALCOLM R. MCGIRT,	Rowland,	Agr.
ZEBULON CROW MAUNEY,	Shelby,	Tex.
JAMES EDWIN MOORE,	Williamston,	M. A.
WALTER GRAHAM MOORE,	Burgaw,	M. A.
WALTER PARKS MOORE,	Charlotte,	M. A.
VICTOR MOTZ,	Lincolnton,	M. A.
VIRGIL LEE NEAL,	Madison,	Agr.
CHARLES GATTIS NICHOLS,	Roxboro,	M. A.
ARTHUR LEE PASCHAL, ✓	Vaughan,	Agr.
CHARLES LEE PAYNE, ✓	Washington,	Tex.
CARL RANDALL PEPPER,	Southport,	M. A.
FRANK HILL PETREE,	Danbury,	M. A.
WILLIAM CRAWFORD PIVER, ✓	Wilson,	M. A.
IRWIN M. PORTER,	Goldsboro,	M. A.
HENRY FRIES PRIMROSE,	Raleigh,	M. A.
ROBERT OWEN PRIMROSE, ✓	Raleigh,	Tex.
CHARLES CONNOR RAMSEY, ✓	Hickory,	Agr.
JAMES PICKETT ROSE, ✓	Statesville,	Tex.
LEE CONSTANT SAVAGE,	Scotland Neck,	M. A.
CLIFFORD FOARD SMITH,	Tar Heel,	M. A.
FRANK ROBERT SMITH,	Scotland Neck,	Agr.
GEORGE ELLIOTT SMITH, ✓	Kinston,	M. A.
JONATHAN RHODES SMITH,	Merry Hill,	M. A.
CECIL PEYTON SOUTHERLAND,	Hickory,	M. A.
DAVID HENRY STEWART,	Greensboro,	Agr.

<i>Name.</i>	<i>Post-office.</i>	<i>Course.</i>
JOHN McIVER SUTTON,	Candor,	M. A.
BENNIE JORDAN THIGPEN,	Tarboro,	Agr.
WILLIAM SIDNEY TOMLINSON, ✓	Goldsboro,	M. A.
ROSCOE CONKLING TUCKER,	Fair Bluff,	M. A.
PAUL VALARR,	Winston,	M. A.
ROBERT CLAY WATT,	Raleigh,	M. A.
LEWIS BRYANT WALL,	Boyd,	M. A.
FRANK WARLICK,	Newton,	M. A.
ROBERT FRANKLIN WARREN,	Gordonton,	Agr.
GEORGE McCLELLAN WILLIAMS,	Raleigh,	M. A.
EDGAR LAFAYETTE WILLIAMS,	Sparta,	Agr.
FRANCIS MARION WILLIAMS,	Phoenix,	Agr.
JAMES HARLEIGH WILLIAMS,	Rialto,	M. A.
LEWIS TAYLOR WINSTON, ✓	Raleigh,	M. A.
CARL FRANCIS YOUNG,	Salisbury,	Agr.

Irregular Students. 17

✓ OLIVER CARTER, ✓	Garland,	E. E.
WILLIAM BENNETT DUNLAP, ✓	Wadesboro,	Tex.
BENJAMIN BALLARD EGERTON, ✓	Ingleside,	M. A.
HENRY D. FARRIOR, ✓	Kenansville,	Tex.
RICHARD HUGH HARPER, ✓	Patterson,	Tex.
SOLOMON WALLACE HOFFMAN, ✓	Statesville,	Bi. and Ch.
JESSE McRAE HOWARD, ✓	Wadesboro,	Tex.
JOSEPH MARSHALL LILES, ✓	Wadesboro,	M. A.
WILLIAM McNEILL McKINNON, ✓	Maxton,	Tex.
FRANK J. McMURRAY, ✓	Wadesboro,	Agr.
PAUL EUGENE MORROW,	Burlington,	Tex.
GARLAND ROBEBSON ROSE,	Statesville,	Draw.
JOHN HOUSTON SHUFORD,	Sandifer,	Tex.
CHARLES ALDERMAN SPAINHOUR, ✓	Lenoir,	M. A.
GEORGE WIMBERLY SPEIGHT, ✓	Wrendall,	M. A.
ATLAS THOMAS UZZELL, JR., ✓	Seven Springs,	Agr.
DONALD WITHERSPOON, ✓	Newton,	E. E.

Special Students. 16

THOMAS JACKSON ARNOLD, JR., ✓	Beverly, W. Va.,	C. E.
JOHN THOMAS BEST, ✓	High Point,	Mch. Shop.
SAMUEL ROMULUS BIGGS,	Williamston,	Mch. Shop.
JOHN HORATIO BLANCHARD,	Woodland,	Mch. Shop.

<i>Name.</i>	<i>Post-office.</i>	<i>Course.</i>
SHERWOOD BATTLE BROCKWELL, ✓	Raleigh,	Mch. Shop.
HENRY PALMER CRAVER, ✓	Boonville,	Mch. Shop.
PAUL FISHER DARDEN,	Murfreesboro,	C. E.
WILLIAM EDWARD DUNN,	Scotland Neck,	Mch. Shop.
PELHAM MARTIN FAUCETT,	Elfland,	Boi. Tend.
JOHN S. GRIERSON,	Mooreville,	Mch. Shop.
JOHN PERCY GRIMES, ✓	Lexington,	Mch. Shop.
ARCHIBALD STUART HALL, ✓	Scotland Neck,	Mch. Shop.
CHARLES WILLARD HARRELL, ✓	Sunbury,	Mch. Shop.
TROYLUS DeCOSTA McBRAYER,	Shelby,	Mch. Shop.
LOUIS GEORGE REGGIO,	Raleigh,	Mch. Shop.
EUGENE THOMAS ROBESON, ✓	Raleigh,	M. E.
GEORGE A. SHUFORD,	Wriston,	Mch. Shop.
J. F. WHITFIELD,	Winstead,	Mch. Shop.
EDWARD YONGE WOOTEN, ✓	Wilmington,	E. E.

Winter Course Students. 2 ✓

THOMAS DUFFY ARNOLD,	Cove,	Dairying.
JAMES HILL BOSTIAN,	Statesville,	Dairying.
JOHN KOONCE BROCK,	Trenton,	Dairying.
WILLIAM REDDEN COKER,	Tarboro,	Dairying.
ARCHIBALD BERRYMAN COLE,	Sanford,	Dairying.
FRANK JONES COURTS,	Reidsville,	Dairying.
MISS EULA LOUISA DIXON,	Snow Camp,	Dairying.
CLAUDE C. ERWIN,	Erwin, Ga.,	Dairying.
JASPER FLEMING,	Milton,	Dairying.
H. J. FOSQUE,	Pollocksville,	Dairying.
J. BURETTE HOUPE,	Charles,	Dairying.
CHARLES HARWARD,	Bridgeport,	Dairying.
JAY L. HUMPHREY,	Clarks,	Dairying.
HILLIARD POSTIL HUNSUCKER,	Conover,	Dairying.
WILLIE MATTHEW McCAULEY,	Chapel Hill,	Dairying.
WILLIAM MUNROE McFADYEN,	Rae ford,	Dairying.
JOHN RUFUS MORRISON,	Statesville,	Dairying.
BENNIE JASPER ROSE,	Kenly,	Dairying.
LUTHER ESPY SIKES,	Greensboro,	Dairying.
ALONZO ALLEN TARLETON,	Long Pine,	Dairying.
ROBERT BERNICE WATSON,	Lemon Springs,	Dairying.
NUMA FLUTCH THOMPSON,	Stagville,	Dairying.

TWELFTH ANNUAL COMMENCEMENT.

May 29, 1901.

BACHELORS OF AGRICULTURE.

<i>Name.</i>	<i>Post-office.</i>	<i>County.</i>
MARTIN KELLOGG,	Sunbury,	Gates.
SOLOMON ALEXANDER VEST, B. S. in Chem., 1900.	Tobaccoville,	Forsyth.

BACHELOR OF SCIENCE (IN BIOLOGY).

WILLIAM PESCUD CRAIGE,	Marion,	McDowell.
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BACHELORS OF SCIENCE (IN CHEMISTRY).

PAUL COLLINS,	Raleigh,	Wake.
WILLIAM FRANKLIN PATE,	Snow Hill,	Greene.
BEVERLY NATHANIEL SULLIVAN,	Winston-Salem,	Forsyth.
CHARLES AUGUSTUS WATSON,	Raleigh,	Wake.

BACHELORS OF ENGINEERING (IN CIVIL ENGINEERING).

FLETCHER HESS BARNHARDT,	Norwood,	Stanly.
FRED WILHELM BONITZ,	Wilmington,	New Hanover.
WILLIAM LOIS CRAVEN,	Concord,	Cabarrus.
WILLIAM DOLLISON FAUCETTE,	Halifax,	Halifax.
BENJAMIN OLIVER HOOD,	Asheville,	Buncombe.
LEWIS OMER LOUGER,	Raleigh,	Wake.
CHARLES HARDEN McQUEEN,	Morven,	Anson.
WALTER STEPHEN STURGILL,	Sturgill,	Ashe.
BENJAMIN VADEN WRIGHT,	Coharie,	Sampson.

BACHELORS OF ENGINEERING (IN ELECTRICAL ENGINEERING).

ZOLLY MOSBY BOWDEN,	Redland,	Davie.
BEDFORD JETHRO BROWN,	Charlotte,	Mecklenburg.
JESSE JAMES LILES,	Wadesboro,	Anson.

BACHELORS OF ENGINEERING (IN MECHANICAL ENGINEERING).

<i>Name.</i>	<i>Post-office.</i>	<i>County.</i>
FELIX GREY CRUTCHFIELD,	Winston-Salem,	Forsyth.
GEORGE MASLIN DAVIS,	Greensboro,	Guilford.
EDWARD OSCAR SMITH,	Crystal Hill,	Halifax, Va.

BACHELOR OF ENGINEERING (IN TEXTILE INDUSTRY).

WILLIAM OSBORNE BENNETT,	Wadesboro,	Anson.
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ELECTRICAL ENGINEER.

NUMA REID STANSEL, B. S. in E. E., 1898.	Allenton,	Robeson.
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PRIZES.**First Prize.**

LEONIDAS JOYNER,	Bunyon,	Beaufort.
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Second Prize.

JAMES CLARENCE TEMPLE,	Sanford,	Moore.
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CHAMBERLAIN PRIZE.**For Best Kept Account of Expenses.**

WALTER LINDSAY FULP,	Fulp,	Stokes.
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For the Least Unnecessary Expenses.

HUGH PIERCE FOSTER,	Nance,	Rockingham.
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HONORS IN SCHOLARSHIP.**Senior Class.**

FLETCHER HESS BARNHART,	Norwood,	Stanly.
WILLIAM PESCUO CRAIGE,	Marion,	McDowell.
WILLIAM DOLLISON FAUCETTE,	Halifax,	Halifax.
MARTIN KELLOGG,	Sunbury,	Gates.
WILLIAM FRANKLIN PATR,	Snow Hill,	Greene.
WALTER STEVEN STURGILL,	Sturgill,	Ashe.

Sophomore Class.

<i>Name.</i>	<i>Post-office.</i>	<i>County.</i>
JOHN ELIOT COIT,	Salisbury,	Rowan.
WALTER LEE DARDEN,	Goldsboro,	Wayne.
JOHN HOWARD GLENN,	Crowder's Creek,	Gaston.
GASTON WILDER ROGERS,	Raleigh,	Wake.
EDWIN SEYMOUR WHITING,	Hamlet,	Richmond.

Freshman Class.

FRANK HAMILTON BROWN,	Cullowhee,	Jackson.
JARVIS BENJAMIN HARDING,	Greenville,	Pitt.
ERNEST EDWIN LINCOLN,	Kinston,	Lenoir.

Short Course Class—First Year.

ODIS HILDRETH HENDERSON,	Hampstead,	Pender.
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HONORS FOR PUNCTUALITY.**Senior Class.**

EDWARD OSCAR SMITH,	Crystal Hill,	Halifax, Va.
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Junior Class.

WILLIAM LEWIS BARLOW,	Tarboro,	Edgecombe.
WILLIAM DAVID BOSEMAN,	Rocky Mount,	Nash.

Sophomore Class.

KENNETH CLYDE WAGSTAFF,	Winstead,	Person.
THEOPHILUS THOMAS ELLIS,	Stubbs,	Cleveland.
JOHN DANIEL FERGUSON,	Bladenboro,	Bladen.
HUGH PIERCE FOSTER,	Nance,	Rockingham.
LAMAR GIDNEY,	Shelby,	Cleveland.
EDWARD ROE STAMPS,	Raleigh,	Wake.

Freshman Class.

WILLIAM RICHARDSON, JR.,	Selma,	Johnston.
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Irregular Students.

JOSEPH EDGAR FULP,	Fulp,	Stokes.
JOHN PERCY GRIMES,	Lexington,	Davidson.

Short Course—First Year.

WILLIAM MCNEILL MCKINNON,	Maxton,	Robeson.
JAMES EUDY THIEM,	Raleigh,	Wake.

REGISTER OF ALUMNI.

CLASS OF 1893.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
ROBERT WILSON ALLEN,	B. E.,	Reidsville, N. C.
	Principal of High School.	
SAMUEL ERSON ASBURY,	B. S.,	Raleigh, N. C.
	M. S. 1896. Assistant Chemist State Agricultural Department.	
HENRY EMIL BONITZ,	B. E.,	Wilmington, N. C.
	Architect.	
FRANK FULLER FLOYD,	B. E.,	Knoxville, Tenn.
	Superintendent Linotype Machines for <i>Knoxville Sentinel</i> .	
CHARLES DUFFY FRANCKS,	B. E.,	Richlands, N. C.
	Farmer and Merchant.	
EDWARD MOORE GIBBON,	B. E.,	Port Royal, S. C.
	Machinist U. S. Government Dock-yard.	
GEORGE PENDER GRAY,	B. S.,	Silver Lake, Fla.
	Farm Manager.	
CHARLES BOLLING HOLLADAY,	B. E.,	Richmond, Va.
	Assistant Treasurer Richmond Trust and Safe Deposit Co.	
WILLIAM MCNEILL LYTCH,	B. E.,	Montbrook, Fla.
	Locomotive Engineer.	
WALTER JEROME MATHEWS,	B. E.,	Goldsboro, N. C.
	Electrician and Chief Engineer for the Eastern N. C. Asylum for the Insane.	
JAMES WILLIAM MCKOY,	B. E.,	Black Mountain, N. C.
	Civil Engineer and Merchant.	
FRANK THEOPHILUS MEACHAM,	B. S.,	Morganton, N. C.
	M. S. 1894. Farm Superintendent State School for Deaf and Dumb.	
CARL DRWITT SELLAES,	B. E.,	Altamaha, N. C.
	Engineer for Altamaha Cotton Mills.	
CHARLES EDGAR SEYMOUR,	B. S.,	Louisburg, N. C.
	Dairy Farm and Stock-raising.	
BUXTON WILLIAMS THORNE,	B. E.,	Holly Springs, Miss.
	Assistant Cashier Merchants and Farmers Bank.	
WILLIAM HARRISON TURNER,	B. E.,	Salem, N. C.
	Secretary and Treasurer Wachovia Mills (F. & H. Pries).	

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
CHARLES BURGESS WILLIAMS, M. S. 1896. Assistant Chemist State Agricultural Department.	B. S.,	Raleigh, N. C.
LOUIS THOMAS YARBROUGH, Associate Engineer Cape Fear Power Co.	B. E.,	Raleigh, N. C.
SAMUEL MARVIN YOUNG, Of S. M. & W. J. Young.	B. E.,	Raleigh, N. C.

CLASS OF 1894.

CHARLES EDWARD CORPENING, Farmer and Dealer in Lumber and Real Estate.	B. E.,	Lenoir, N. C.
DAVID COX, JR., Architect and County Surveyor.	B. E.,	Hertford, N. C.
ROBERT DONNELL PATTERSON, JR., M. S. 1898. With American Tobacco Co.	B. S.,	Durham, N. C.
CHARLES PEARSON, Architect.	B. E.,	Mobile, Ala.
ZEBBIE GEORGE ROGERS, Secretary and Treasurer.	B. E.,	Danville, Va.
JOHN HYER SANDERS, Locomotive Engineer N. & C. E. R.	B. E.,	Pinners Point, Va.
BENJAMIN FRANKLIN WALTON, Farmer.	B. S.,	Neuse, N. C.
JOHN McCAMY WILSON, Chief Engineer Spartanburg Railway, Gas and Electric Co.	B. E.,	Spartanburg, S. C.

CLASS OF 1895.

*THOMAS MARTIN ASHE, Architect—Pearson & Ashe.	B. E.,	Raleigh, N. C.
JAMES ADRIAN BIZZELL, M. S. 1900. Graduate Student and Fellow in Chemistry Cornell University	B. S.,	Raleigh, N. C.
JOHN ISHAM BLOUNT, C. E. 1897. M. E. Cornell University. Chief Engineer Tennessee Coal, Iron, Steel R. R. Co.	B. E.,	Ensley, Ala.
JAMES WASHINGTON BRAWLEY, Traveling Salesman.	B. S.,	Mooreville, N. C.
WALTER AUSTIN BULLOCK, Superintendent Tobacco Farm.	B. S.,	Climax, Ga.

*Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
DAVID CLARK (M. E. Cornell Univ.), M. E. 1896. C. E. 1897. General Manager and Treasurer Ada Cotton Mills and President Eugenia Manufacturing Co., Jonesboro, N. C.	B. E.,	Charlotte, N. C.
GEO. WASHINGTON CORBETT, JR., Machinist and Chief Engineer Durham Traction Co.	B. E.,	Durham, N. C.
EDWIN SPEIGHT DARDEN, With W. T. Clark & Co., Tobacconists.	B. S.,	Wilson, N. C.
WILLIAM KEARNEY DAVIS, JR., Superintendent Southside Manufacturing Co.	B. E.,	Salem, N. C.
JOSEPH CHARLES DEY, With Williams Bros.	B. S.,	Norfolk, Va.
LEE BORDEN ENNETT, Farmer.	B. S.,	Cedar Point, N. C.
ISAAC HENRY FOUST, Farmer and Mechanic McCormick Harvesting Machine Co.	B. E.,	Radseur, N. C.
CHARLES WYLLIS GOLD, Business Manager <i>Wilson Times</i> , Editor <i>Dixie Farmer</i> .	B. S.,	Wilson, N. C.
WILLIAM HENRY HARRIS, M. E. 1896. Editor <i>Textile Excelsior</i> .	B. E.,	Charlotte, N. C.
CHRISTOPHER MILLER HUGHES, B. S. 1899. With Commercial and Farmers Bank.	B. E.,	Raleigh, N. C.
MALCOLM BEALL HUNTER, Textile Designer.	B. E.,	Philadelphia, Pa.
SAMUEL CHRISTOPHER MCKEOWN, Superintendent Machine Shops.	B. E.,	Cornwell, S. C.
MANN CABE PATTERSON, With Richmond Locomotive and Machine Works.	B. E.,	Richmond, Va.
ABRAM HINMAN PRINCE, U. S. Soil Survey.	B. S.,	Washington, D. C.
VICTOR VASHTI PRIVOTT, Construction Engineer.	B. E.,	Pittsburg, Pa.
HOWARD WISWALL, JR., Inspector United States Engineers.	B. E.,	Norfolk, Va.
CHARLES GARRETT YARBROUGH, With Westinghouse Electric Company.	B. E.,	Pittsburg, Pa.
CHARLES MARCELLUS PRITCHETT, C. E. 1896. With D. A. Tompkins Co.	M. E.,	Charlotte, N. C.

CLASS OF 1896.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
DANIEL ALLEN,	B. S.,	Raleigh, N. C. Daniel Allen & Co.
GEORGE STRONACH FRAPS,	B. S.,	Raleigh, N. C. Ph. D. Johns Hopkins University; Assistant Professor of Chemistry N. C. College of Agriculture and Mechanic Arts.
MARION JACKSON GREEN,	B. S.,	Charlotte, N. C. Foreman Cole Manufacturing Co.
JOHN HOWARD,	B. S.,	Shelbyville, Ky. Civil Engineer Southern Railway Co.
WILLIAM COLBERT JACKSON,	B. S.,	Ayden, N. C. General Merchant.
ROBERT GRAHAM MEWBORNE,	B. S.,	Louisville, Ky. Chemist Kentucky Tobacco Product Co.
LEVI ROMULUS WHITTED,	B. S.,	Norfolk, Va. C. E. 1897. Draughtsman in Navy-yard.
HENRY LLOYD WILLIAMS,	B. S.,	Merchant Mills, N. C. Merchant.

CLASS OF 1897.

JOSEPH SAMUEL BUFFALOE,	B. S.,	Garner, N. C. Physician.
JOHN WILLIAM CARROLL,	B. S.,	Richmond, Va. Student Medical College of Virginia.
CHARLES EDWARD CLARK,	B. S.,	Charlotte, N. C. Truck Farmer.
WM. ALEXANDER GRAHAM CLARK,	B. S.,	Jonesboro, N. C. M. E. Cornell Univ. General Manager and Treasurer Eugenia Mfg. Co.
NICHOLAS LOUIS GIBBON,	B. S.,	Greenville, S. C. Mill Architect and Engineer.
CEBURN DODD HARRIS,	B. S.,	Raleigh, N. C. Assistant Chemist N. C. Department of Agriculture and Assistant in Analytical Chemistry Cornell University.
JERE EUSTIS HIGHSMITH,	B. S.,	Parkersburg, N. C. Farmer.
CLYDE BENNETT KENDALL,	B. S.,	Columbia, S. C. Civil Engineer Baltimore & Ohio R. R.
SYDNEY GUSTAVUS KENNEDY,	B. S.,	Newport News, Va. With Newport News Ship Building Co.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
JOSEPH LAWRENCE KNIGHT, Turpentine Business.	B. S.,	Jacksonville, Fla.
WALTER JONES McLENDON, JR., Superintendent Wadesboro Cotton Mill.	B. S.,	Wadesboro, N. C.
REPTON HALL MERRITT, Book-keeper Cotton Mill.	B. S.,	McAdenville, N. C.
ALBERT HICKS OLIVER, Dairyman and Farm Superintendent.	B. S.,	New Orleans, La.
HUGH WILLIAMS PRIMROSE, M. S. 1900. Chemist Tennessee Coal, Iron and Railroad Co.	B. S.,	Sheffield, Ala.
WILLIAM HUNTER SAUNDERS, Chief Engineer Roanoke Navigation and Water Power Co.	B. S.,	Roanoke Rapids, N. C.
THOMAS JEHU SMITHWICK, Electrical Engineer Navy-yard.	B. S.,	Port Royal, S. C.
LEA WATSON, Mechanical Engineer D. A. Tompkins Co.	B. S.,	Charlotte, N. C.
*BRADLEY JEWETT WOOTEN, Lieutenant U. S. Army.	B. S.,	Wilmington, N. C.

CLASS OF 1898.

DORSEY FROST ASBURY, Draughtsman Newport News Ship Building and Dry Dock Co.	B. S.,	Newport News, Va.
SIDNEY HAMILTON BECK, Draughtsman Newport News Ship-yards.	B. S.,	Newport News, Va.
ANSON ELIKEM COHOON, With Forestry Division Department of Agriculture.	B. S.,	Washington, D. C.
HUGH McCULLOM CURRAN, With Forestry Division Department of Agriculture.	B. S.,	Washington, D. C.
BENJAMIN CAREY FENNELL, M. E., 1900. Engineer and Salesman D. A. Tompkins Co.	B. S.,	Charlotte, N. C.
ALPHEUS ROUNTREE KENNEDY, Draughtsman Eastern Ship Building Co.	B. S.,	Gratan, Conn.
FREDERICK CREECY LAMB, Assistant Chemist N. C. Department of Agriculture.	B. S.,	Raleigh, N. C.
EDWIN BENTLEY OWEN, Instructor in English and Librarian N. C. College of Agriculture and Mechanic Arts.	B. S.,	Raleigh, N. C.

*Deceased.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
MOORE PARKER, Assistant in Carding and Spinning	B. S.,	Clemson, S. C. Clemson Agricultural College.
NUMA REID STANSEL, Electrical Engineering Student	B. S.,	Ithaca, N. Y. Cornell University.
TEISAKU SUGIHIITA, Engineer	B. S.,	Tokyo, Japan. Imperial Railway of Japan.
GEORGE FREDERICK SYME, Civil Engineer	B. S.,	Franklin, W. Va. with West Virginia Central Railway.

CLASS OF 1899.

WM. DAVIDSON ALEXANDER, JR., Assistant Superintendent	B. S.,	Charlotte, N. C. Mecklenburg Iron Works.
IRA WILSON BARBER, Electrical Machinist	B. S.,	Port Royal, S. C. Naval Station.
JOHN HENDERSON BIRDSONG, Chemist	B. S.,	Bessemer, Ala. Tennessee Coal, Iron and Railway Co.
FRANCIS MARION FOY, Post-graduate Electrical Engineering and Instructor	B. S.,	Raleigh, N. C. N. C. College of Agriculture and Mechanic Arts.
ALBERT SIDNEY LYON, Superintendent	B. S.,	Roanoke Rapids, N. C. Roanoke Navigation and Water Power Co.'s Electrical Power Plant.
CARROLL LAMB MANN, Civil Engineer	B. S.,	Raleigh, N. C. with S. A. L.
O'KELLY WILLIAM MYERS, Civil Engineer	B. S.,	Camden, S. C. with S. A. L.
EUGENE LEROY PARKER, Chemist	B. S.,	Charleston, S. C. Virginia-Carolina Chemical Co.
EUGENE GRAY PERSON, Book-keeper	B. S.,	Concord, N. C. Gibson Manufacturing Co.
FREDERICK ERASTUS SLOAN, Registrar	B. S.,	Raleigh, N. C. N. C. College of Agriculture and Mechanic Arts.
ANDREW THOMAS SMITH, Erecting Machinist	B. S.,	Youngstown, Ohio. The Lloyd-Booth Co.
ALEXIS PRESTON STEELE, Of J. C. Steele & Son's	B. S.,	Statesville, N. C. Brick Machinery Co.
WILLIAM ANDERSON SYME, Instructor in Chemistry	B. S.,	Raleigh, N. C. N. C. College of Agriculture and Mechanic Arts.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
HUGH WARE,	B. S.,	King's Mountain, N. C.
	Farmer.	
CLAUD BURGESS WILLIAMS,	B. S.,	Richmond, Va.
		Student University College of Medicine.

CLASS OF 1900.

KEMP ALEXANDER,	B. E.,	Albemarle, N. C.
		With Windemere Knitting Mill.
LESLIE LYLE ALLEN,	B. E.,	Newport News, Va.
		Draughtsman Newport News Ship Building Co.
ROBERT LINN BERNHARDT,	B. S.,	Salisbury, N. C.
		With Salisbury Hardware and Furniture Co.
LESLIE GRAHAM BEBRY,	B. E.,	Wilmington, Del.
		With American Bridge Co.
JAMES HARRY BUNN,	B. E.,	Henderson, N. C.
		Assistant Secretary Henderson Cotton Mill.
SAMUEL MERRILL HANFF,	B. S.,	Raleigh, N. C.
		Instructor Morson's Academy.
GEORGE ROLAND HARRELL,	B. S.,	Copperfield, Vt.
		Chemist Copperfield Mines.
HENRY ALLEN HUGGINS,	B. S.,	Wilmington, N. C.
GARLAND JONES, JR.,	B. S.,	Chicago, Ill.
		Chemist Armour & Co.
LOUIS HENRY MANN,	B. E.,	Baltimore, Md.
		Student Dental College University of Maryland.
ROBERT HALL MORRISON,	B. E.,	Mariposa, N. C.
		Assistant Superintendent Cotton Mill.
WILLIAM MONTGOMERY PERSON,	B. E.,	Bethlehem, Pa.
		Student Lehigh University.
JUNIUS EDWARD PORTER,	B. E.,	Jacksonville, Fla.
		Timber Inspector S. A. L.
ROGER FRANCIS RICHARDSON,	B. E.,	Newport News, Va.
		Draughtsman Newport News Ship Building Co.
WILLIAM EDWIN ROSE,	B. E.,	Wilmington, N. C.
		With Wilmington Iron Works.
FLOYD DE ROSS,	B. E.,	Charlotte, N. C.
		Electrician.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
IRA OBED SCHAUB, Student in Chemistry Johns Hopkins University.	B. S.,	Baltimore, Md.
JOHN WADE SHORE, Farmer.	B. S.,	Boonville, N. C.
WILLIAM TURNER SMITH, With Wilmington Iron Works.	B. E.,	Wilmington, N. C.
SOLOMON ALEXANDER VEST, Chemist Navassa Guano Co.	B. S.,	Wilmington, N. C.
ROSCOE MARVIN WAGSTAFF, With Newport News Ship Building Co.	B. E.,	Newport News, Va.
GAITHER HALL WHITING, Assistant Chemist Virginia-Carolina Chemical Co.	B. S.,	Richmond, Va.

CLASS OF 1901.

FLETCHER HESS BARNHARDT, Draughtsman with Phoenix Bridge Co.	B. E.,	Phoenixville, Penn.
WILLIAM OSBORNE BENNETT, Farmer.	B. E.,	Wadesboro, N. C.
FRED WILLIAM BONITZ, Mechanical Constructor Standard Oil Co.	B. E.,	Baltimore, Md.
ZOLLY MOSBY BOWDEN, Testing Department General Electric Co.	B. E.,	Schenectady, N. Y.
BEDFORD JETHRO BROWN, With the Westinghouse Electric Co.	B. E.,	Pittsburg, Penn.
PAUL COLLINS, Chemist Caraleigh Phosphate and Fertilizer Co.	B. S.,	Raleigh, N. C.
WILLIAM PESCUD CRAIGE, With Peter F. Pescud, Insurance.	B. S.,	New Orleans, La.
WILLIAM LOIS CRAVEN, Structural Draughtsman American Bridge Co.	B. E.,	Pittsburg, Penn.
FELIX GRAY CRUTCHFIELD, Machinist Baldwin Locomotive Works.	B. E.,	Philadelphia, Penn.
GEORGE MASLIN DAVIS, With Salem Iron Works.	B. E.,	Winston-Salem, N. C.
WILLIAM DOLLISON FAUCETTE, Civil Engineer S. A. L. Railway.	B. E.,	Savannah, Ga.
BENJAMIN OLIVER HOOD, Structural Draughtsman American Bridge Co.	B. E.,	Pittsburg, Penn.

<i>Name.</i>	<i>Degree.</i>	<i>Address.</i>
MARTIN KELLOGG,	B. Agr.,	Sunbury, N. C.
JESSE JULIAN LILES,	Farmer, B. E.,	Philadelphia, Penn.
	Machinist, Baldwin Locomotive Works.	
LEWIS OMER LOGGEE,	B. E.,	Pittsburg, Penn.
	Structural Draughtsman, American Bridge Co.	
CHARLES HARDEN MCQUEEN,	B. E.,	Durham, N. C.
	Civil Engineer with J. L. Ludlow, C. E.	
WILLIAM FRANKLIN PATE,	B. S.,	Urbana, Ill.
	Assistant Chemist, Agricultural Experiment Station.	
EDWARD OSCAR SMITH,	B. E.,	Newport News, Va.
	Draughtsman, Newport News Ship Building and Dry Dock Co.	
WALTER STEPHEN STURGILL,	B. E.,	Raleigh, N. C.
	Instructor in Mathematics Agricultural and Mechanical College.	
BEVERLY NATHAN SULLIVAN,	B. S.,	Winston-Salem, N. C.
	With Winston-Salem Gas and Lighting Establishment.	
CHARLES AUGUSTUS WATSON,	B. S.	
	Graduate Student at A. & M. College.	
BENJAMIN VADEN WRIGHT,	B. E.,	Beaumont, Texas.
	Engineer's Office.	